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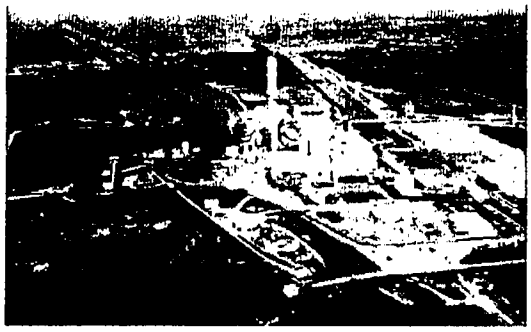
080009-EI

DOCUMENT NUMBER-DATE
03237 APR 22 08
FPSC-COMMISSION CLERK

AREVA

Engineering Design and Licensing
For CR3
Measurement Uncertainty Recapture (MUR)
Power Uprate Project
For CR3 Nuclear Power Station



Proposal Request from:
Progress Energy

AREVA NP Proposal
#4161084

Dated: December 8, 2006
Validity: December 31, 2006

Prepared By:

AREVA NP Inc.
3315 Old Forest Road
P.O. Box 10935
Lynchburg, Virginia 24506-0935

DOCUMENT NUMBER-DATE
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Executive Summary iv
1.0 INTRODUCTION 1
2.0 WORKSCOPE 2

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3.0 COMMERCIAL 49

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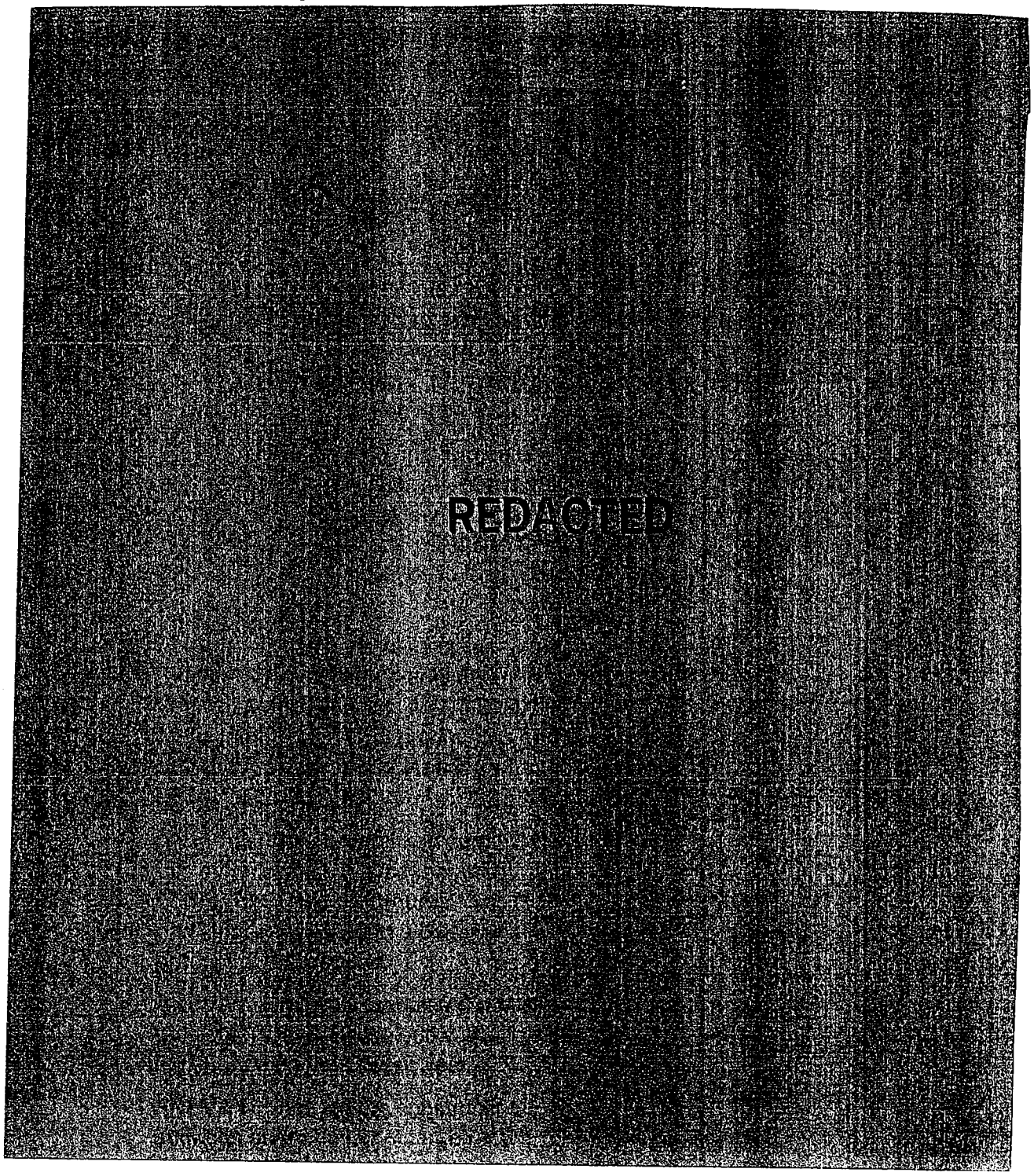
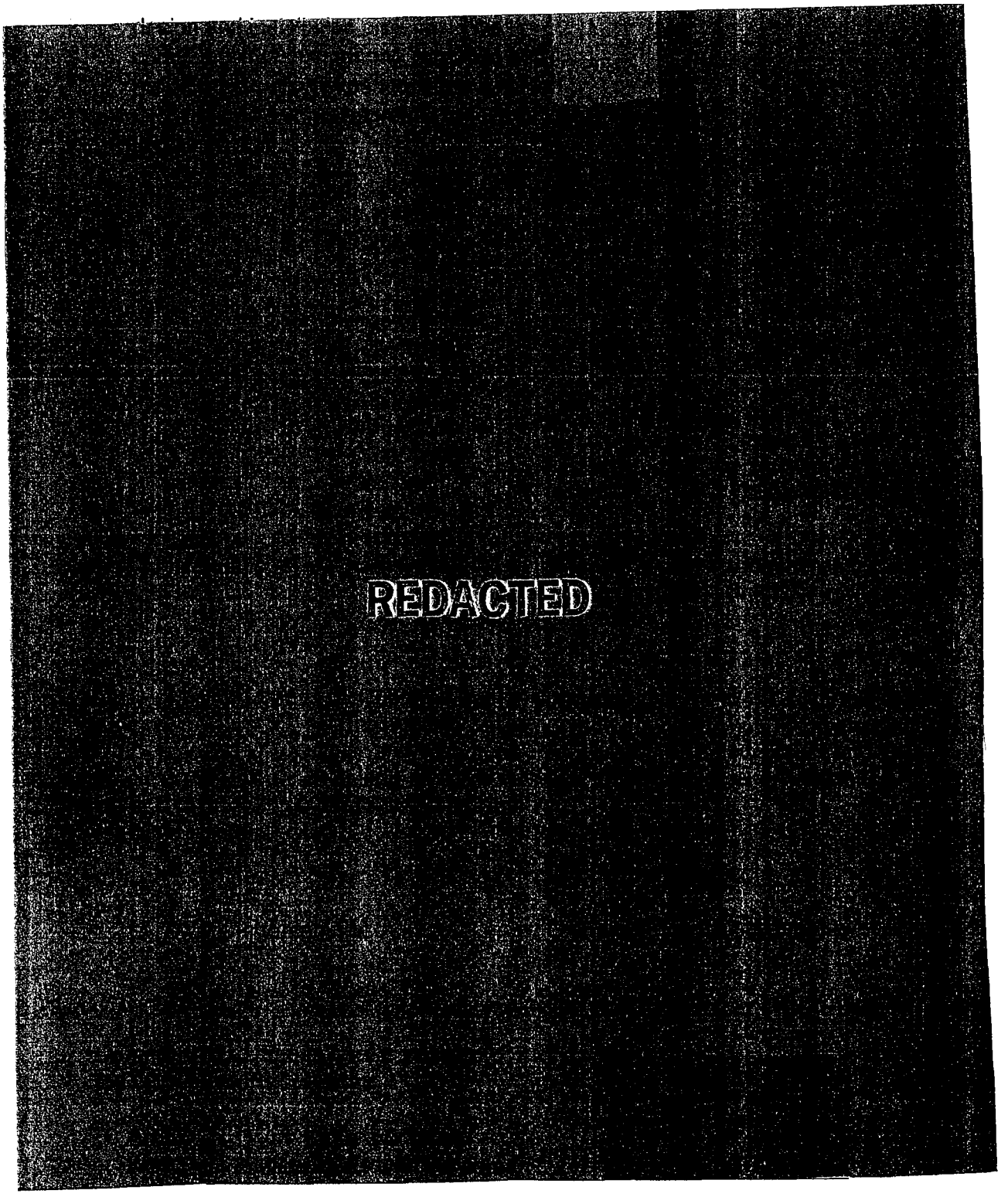
Executive Summary

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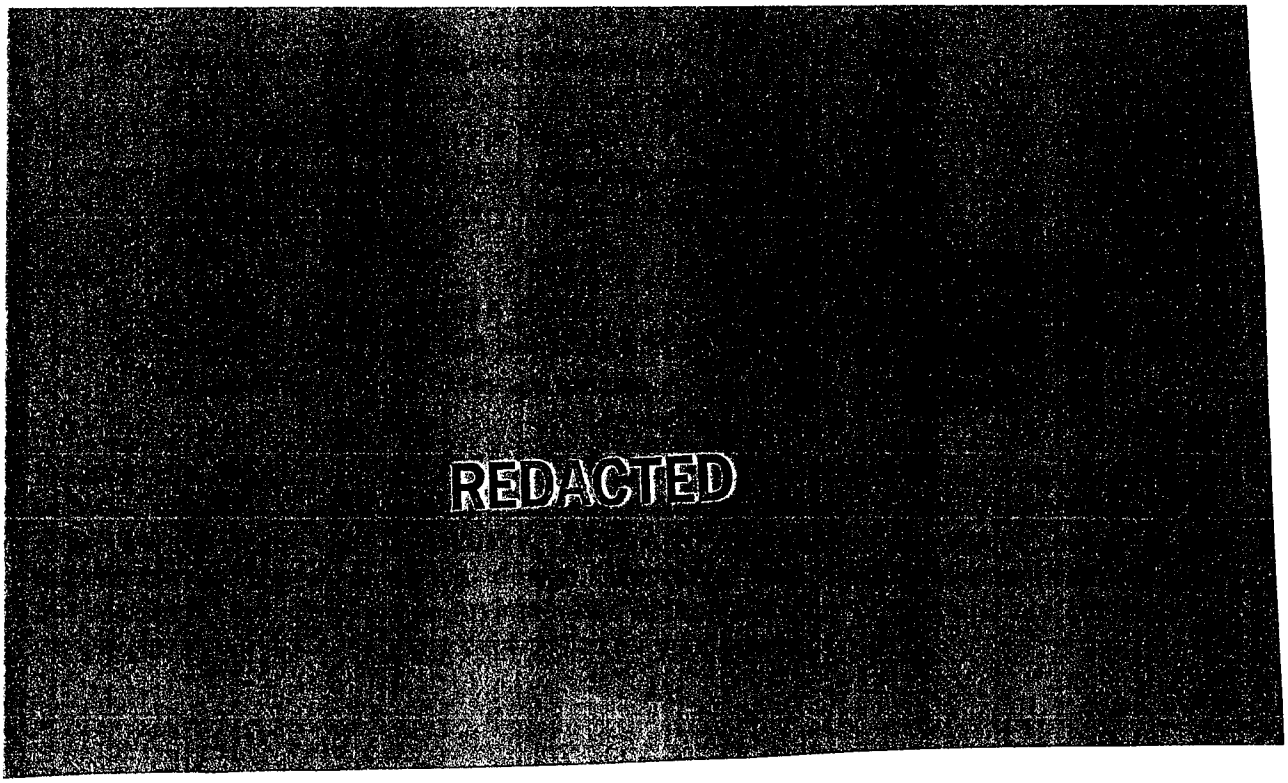
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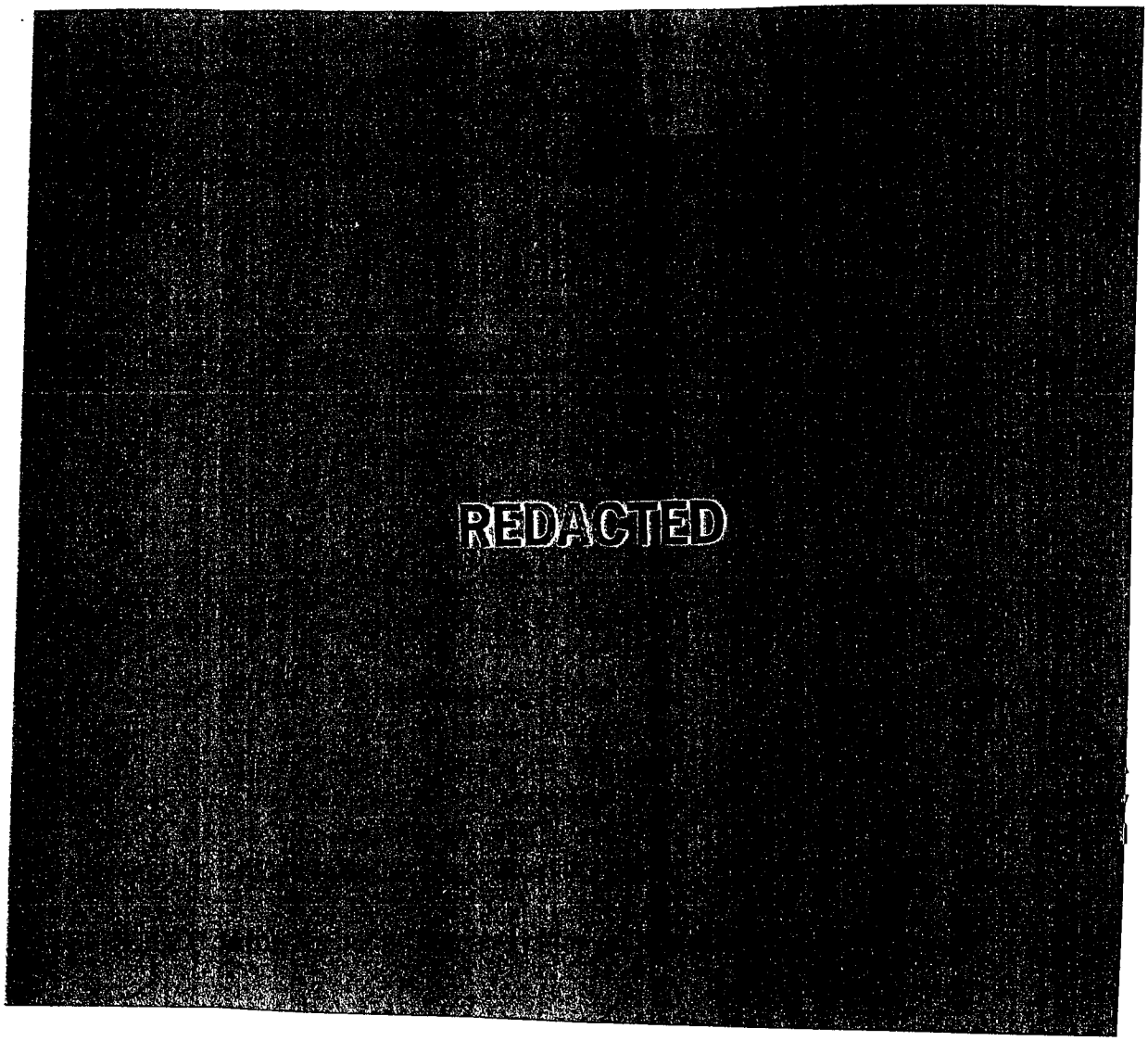

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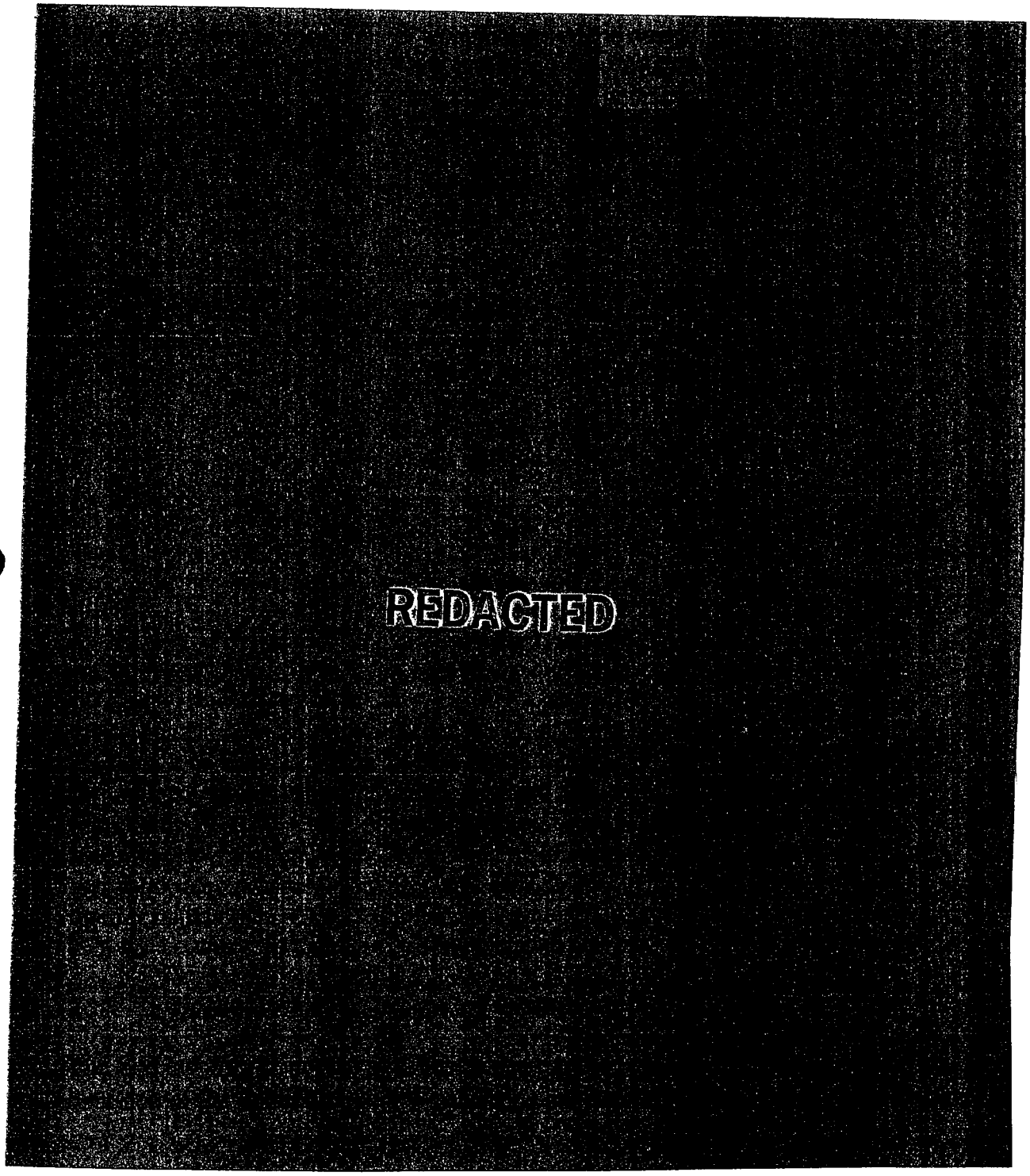

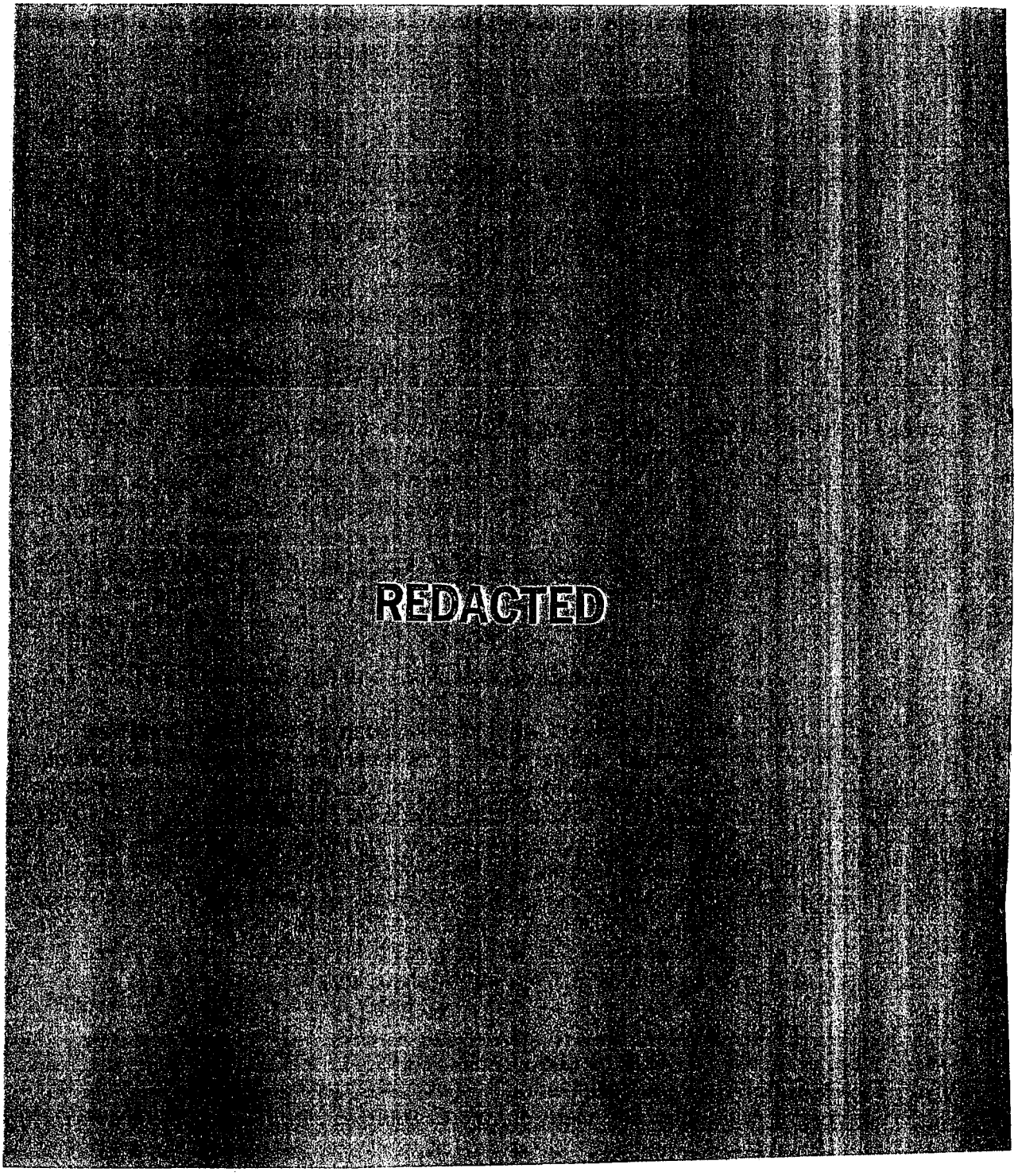
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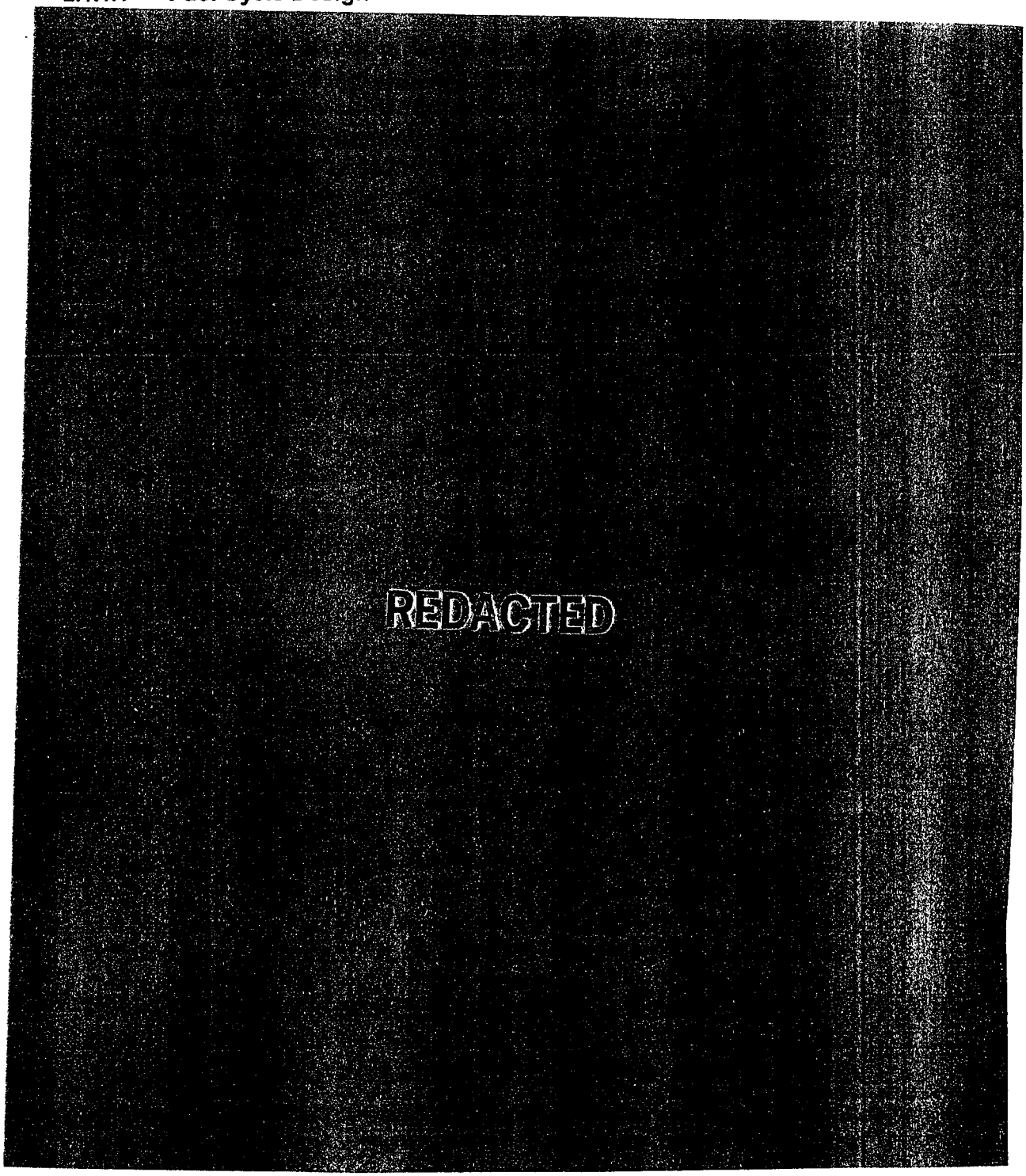

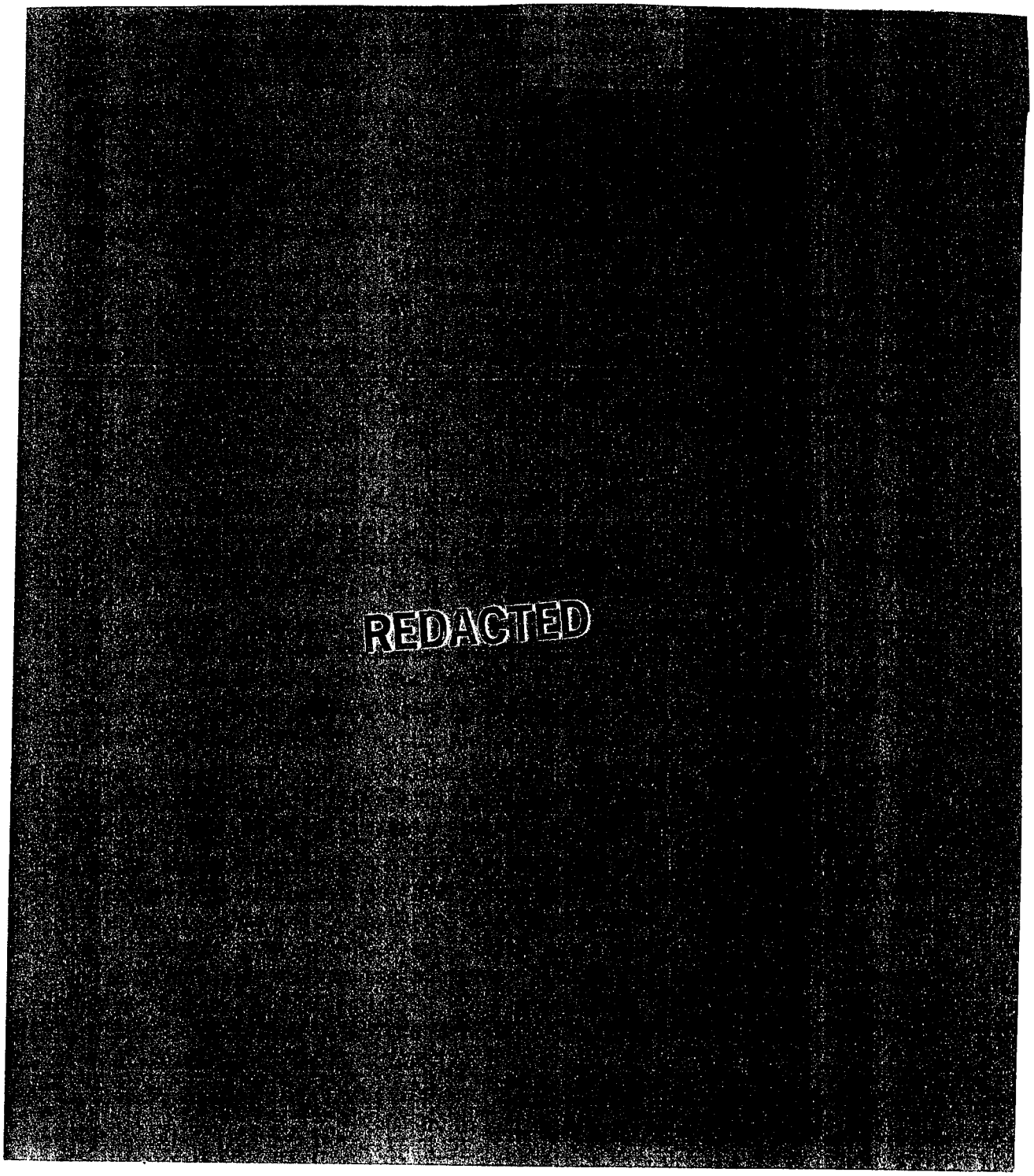
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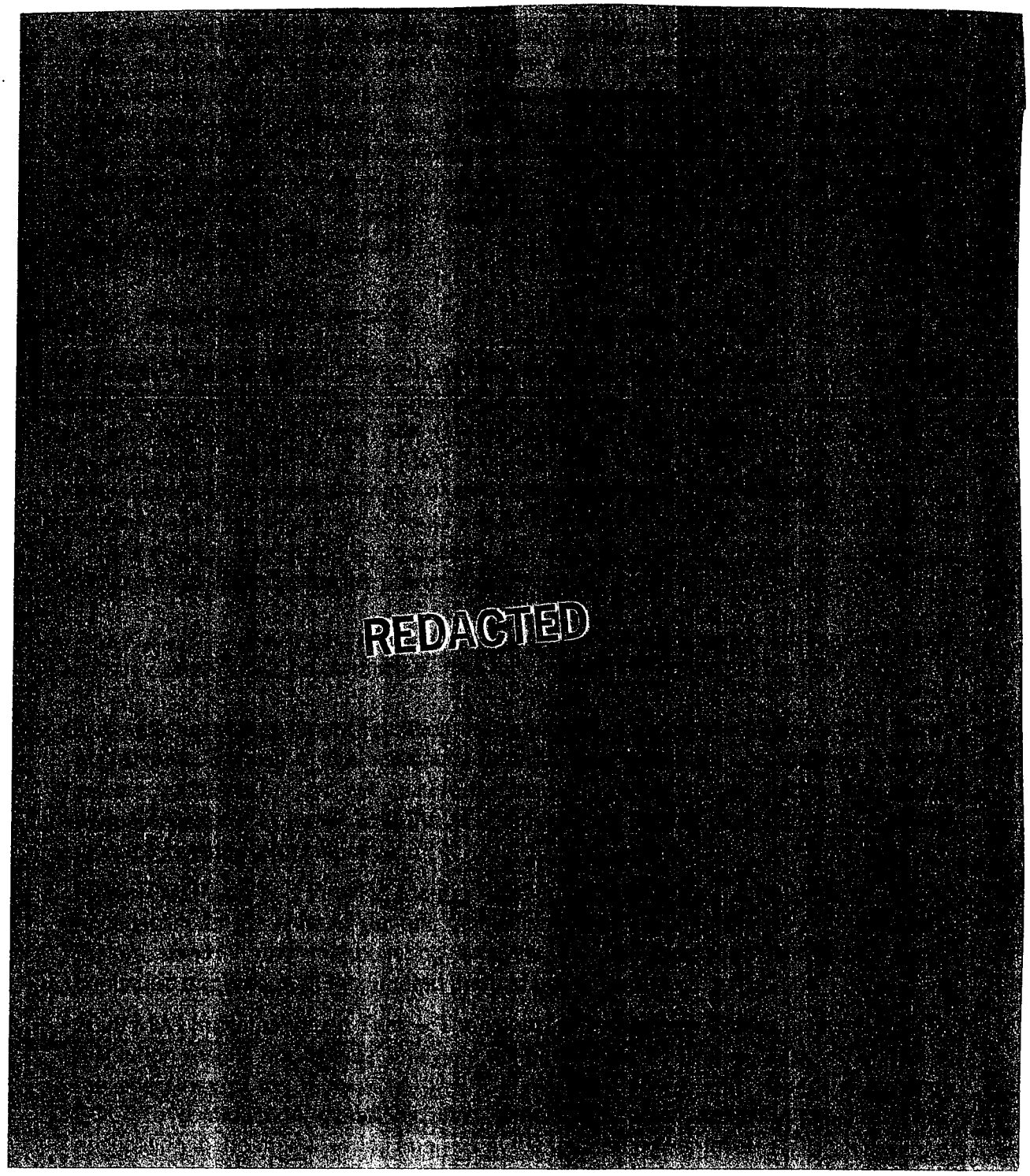
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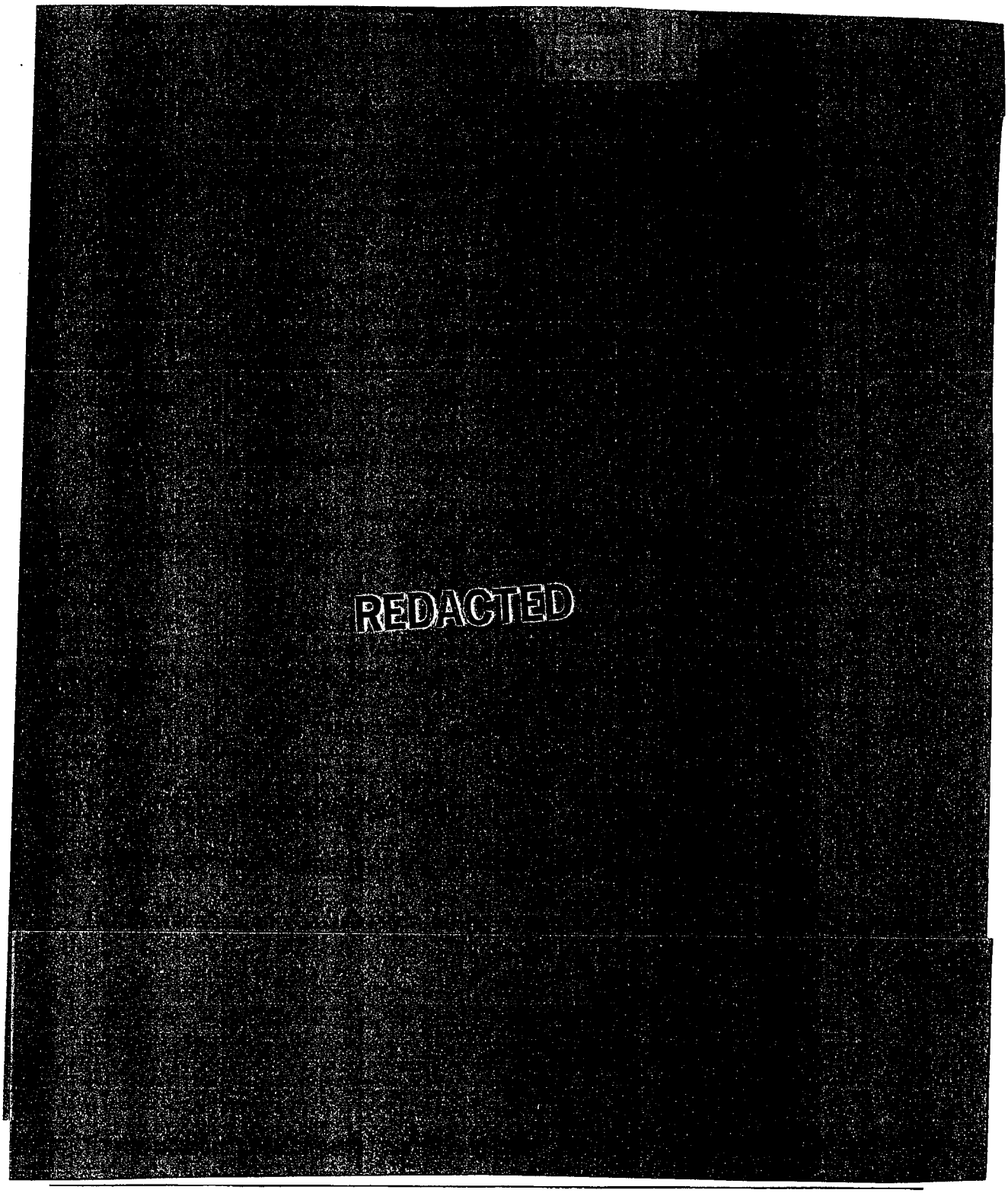
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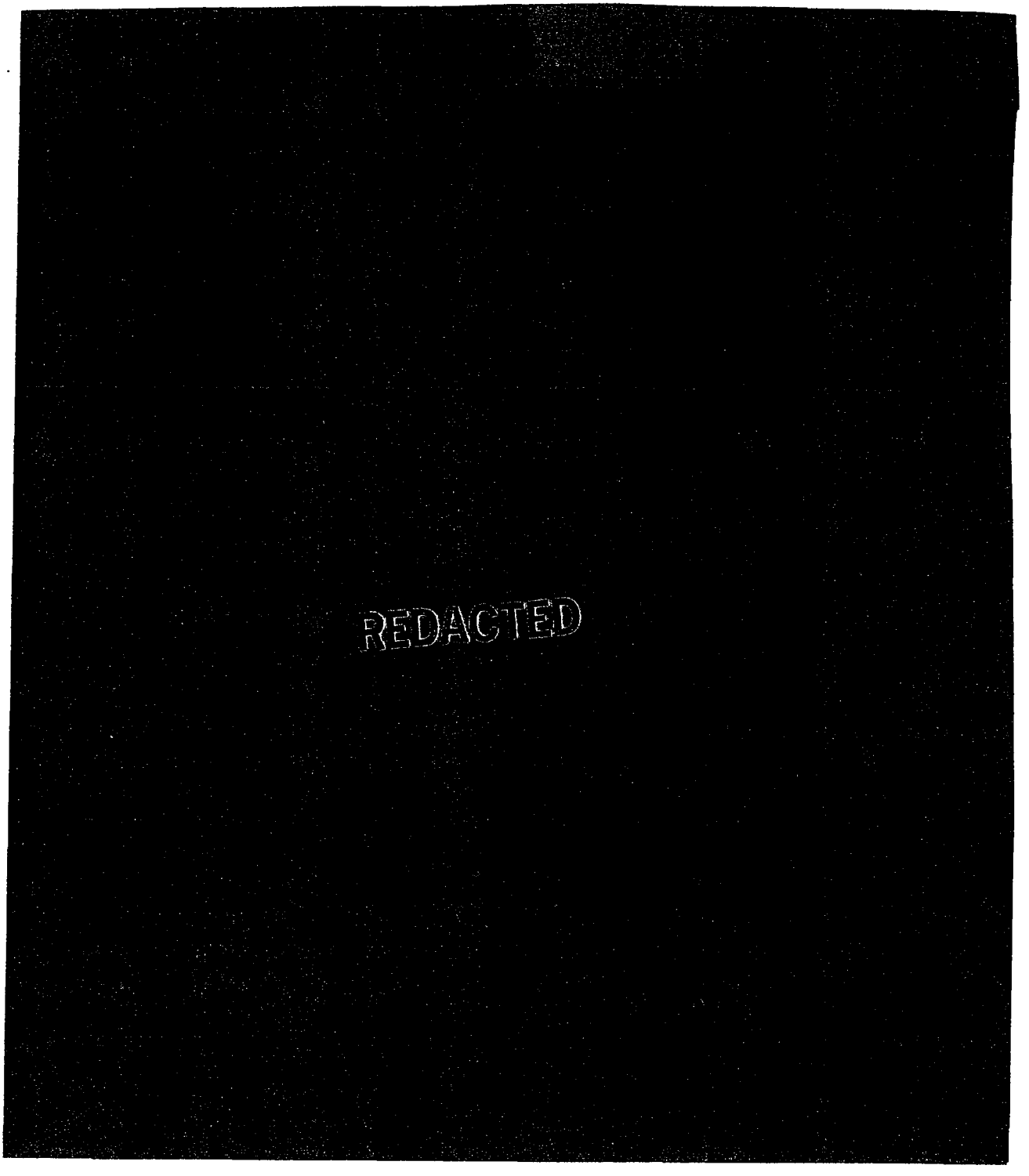
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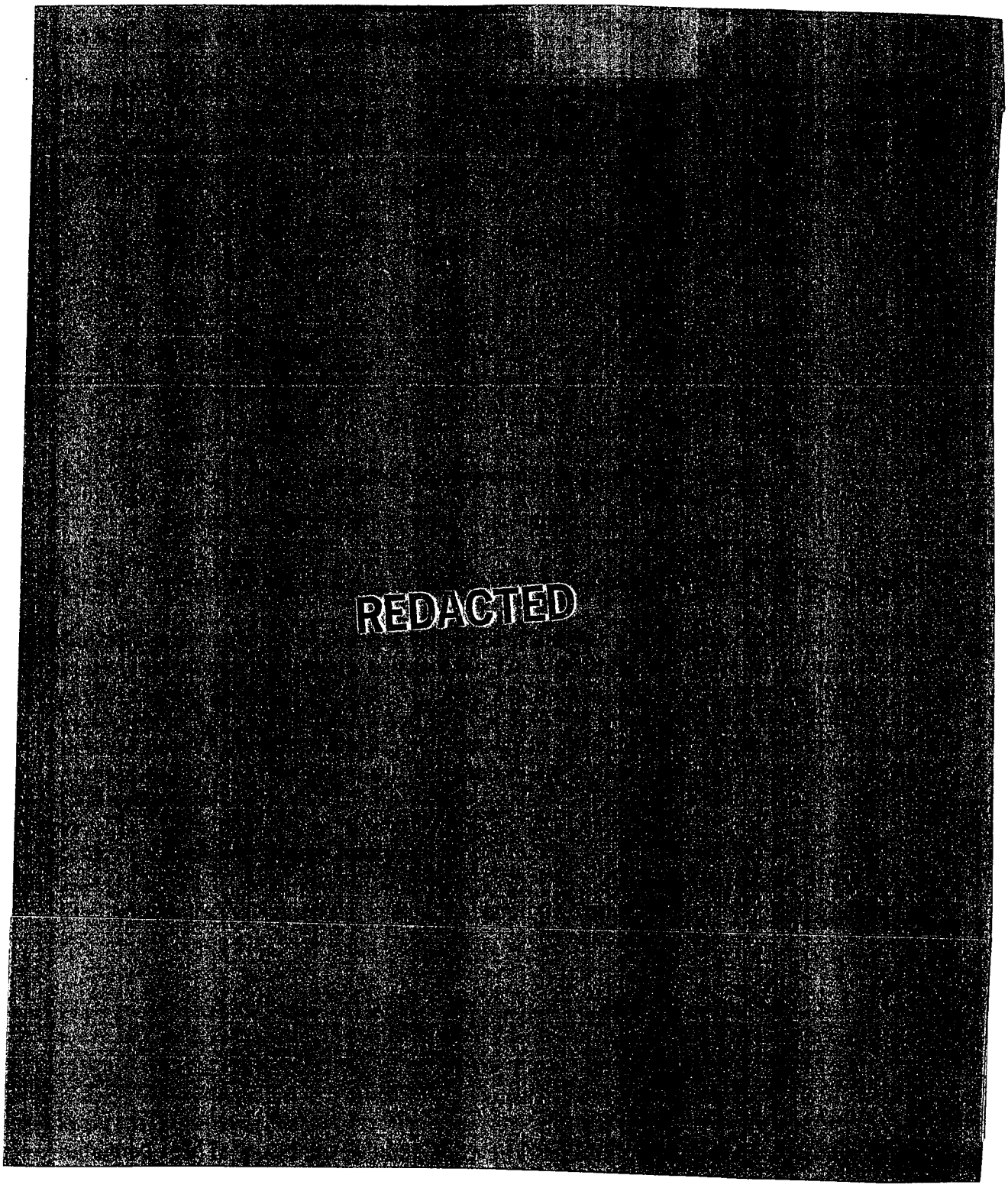

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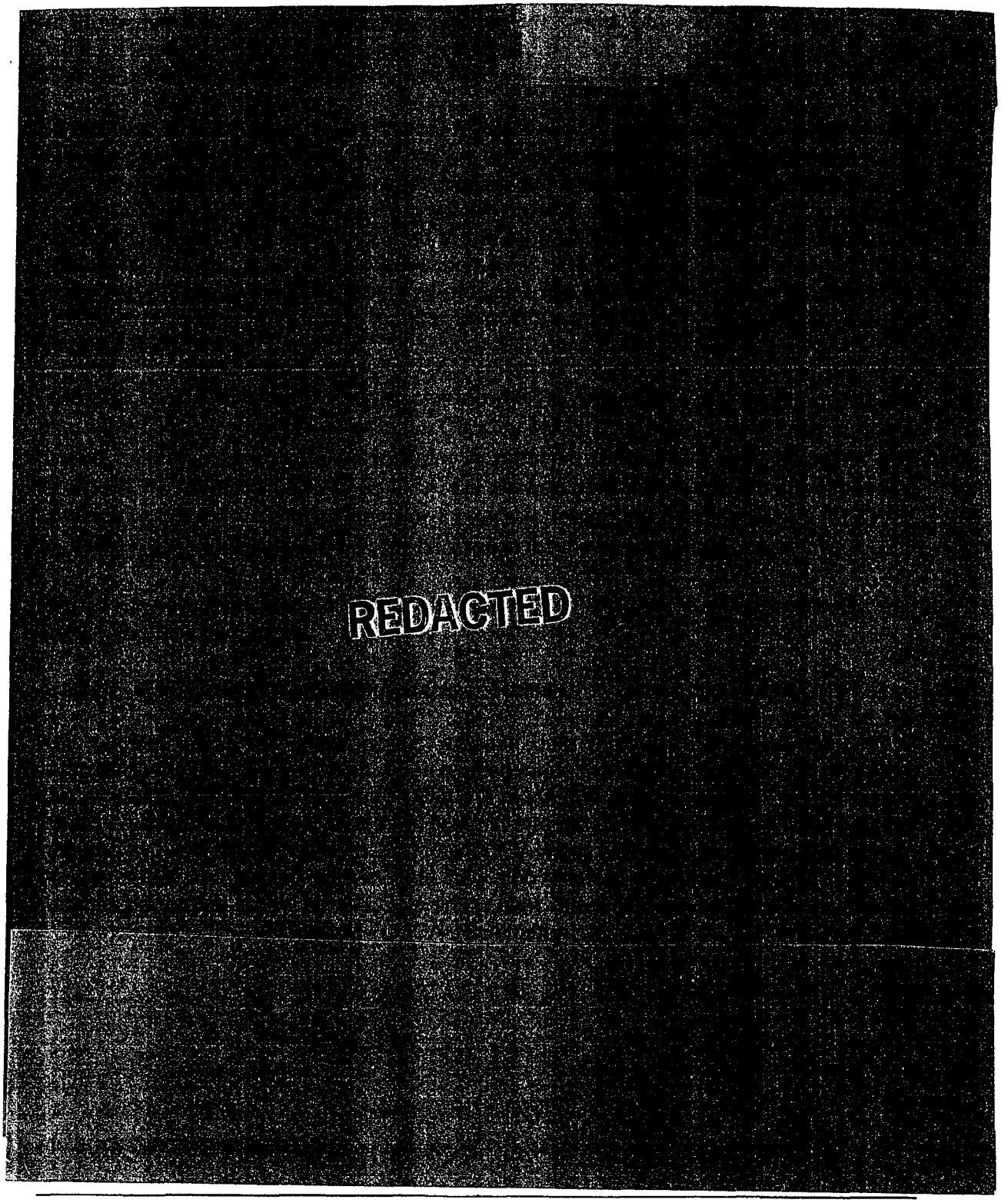
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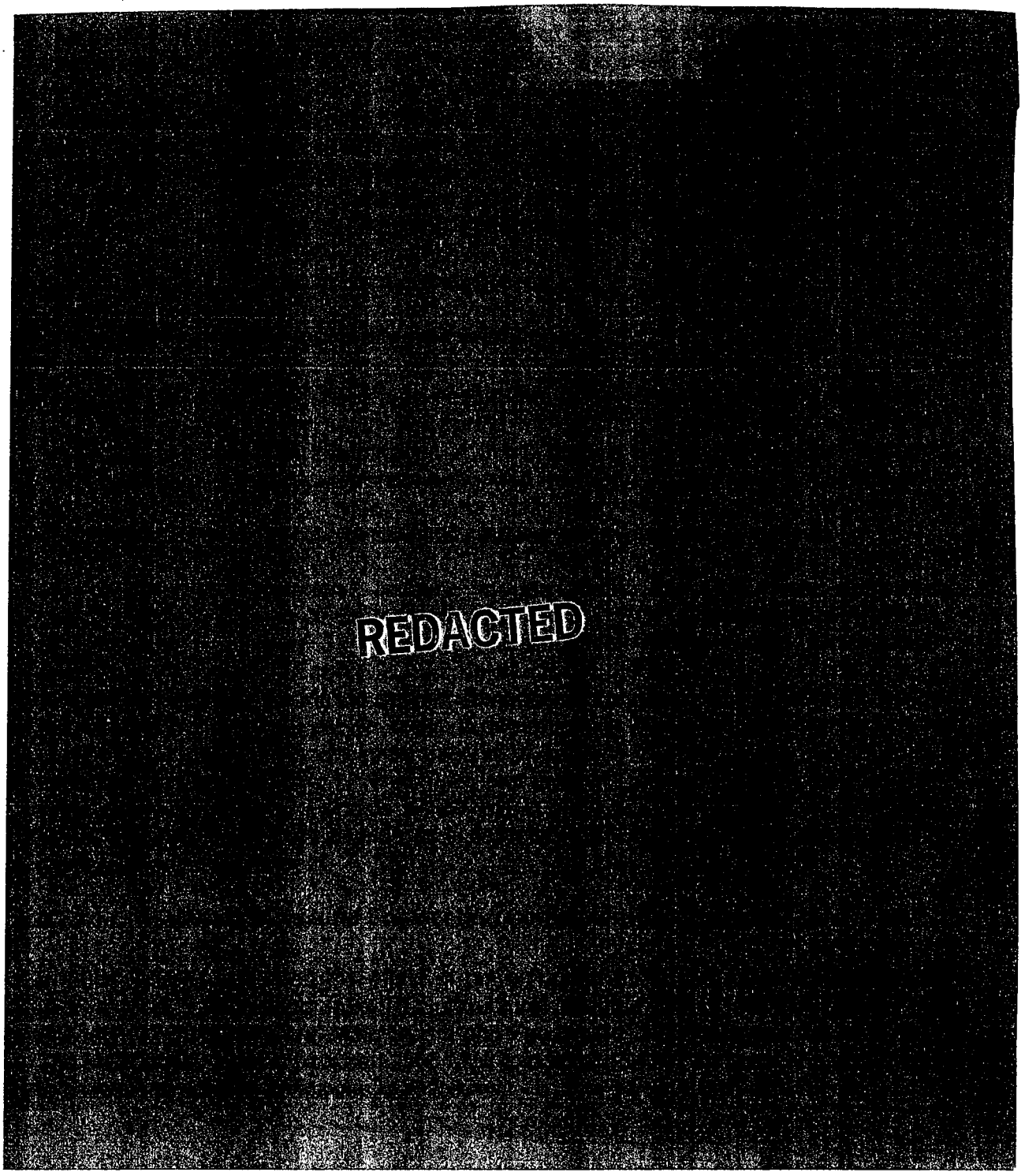
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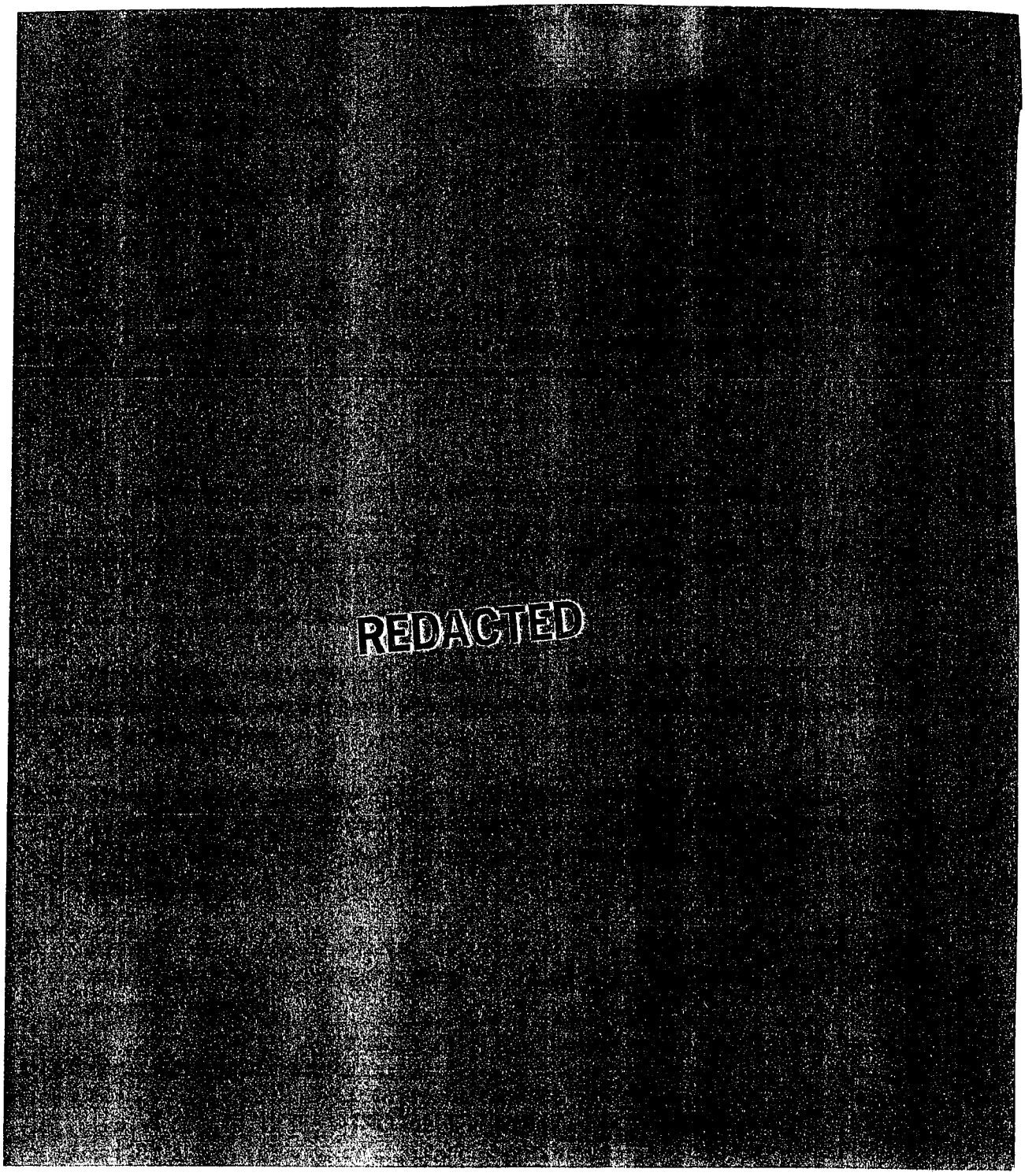
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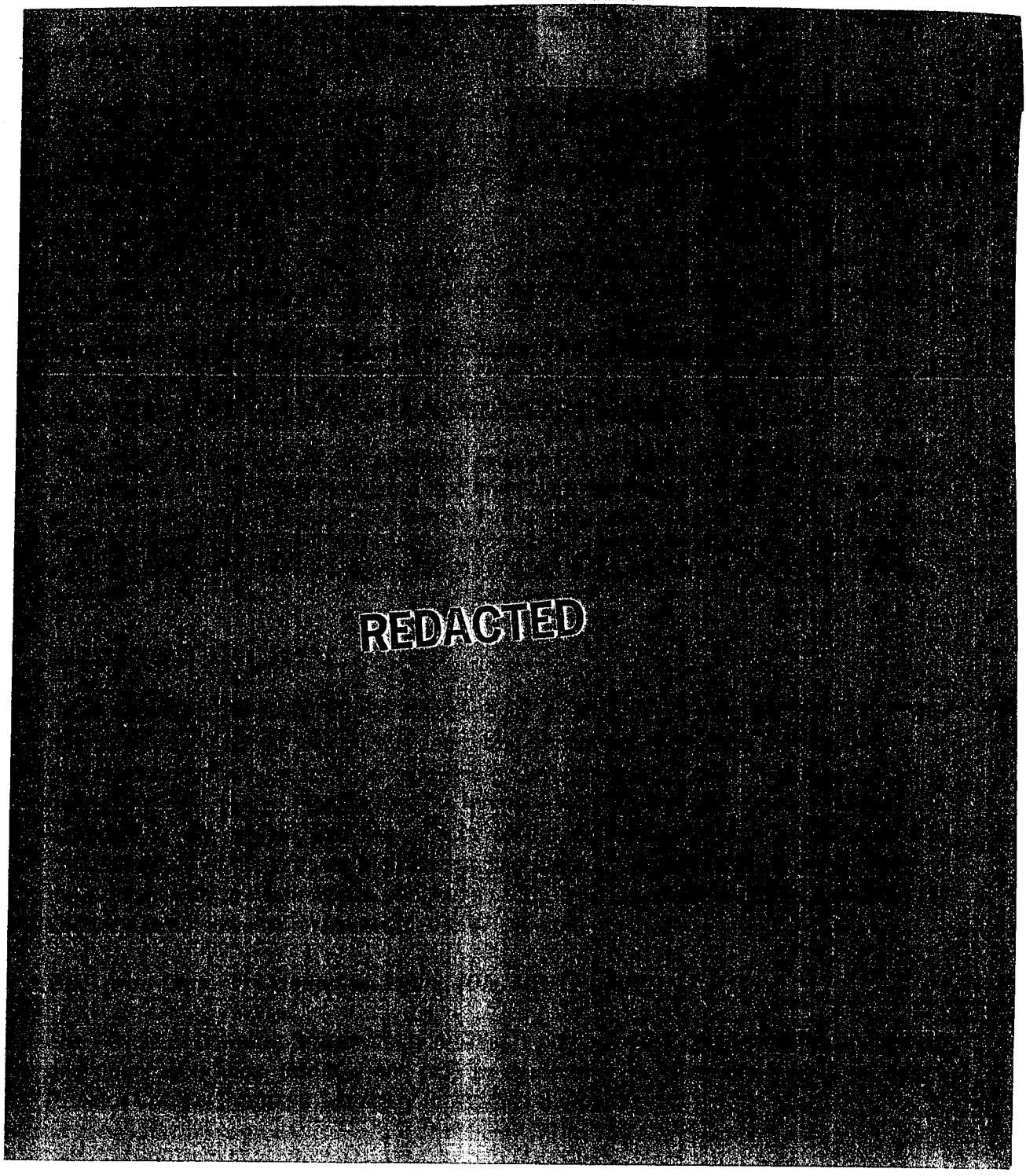

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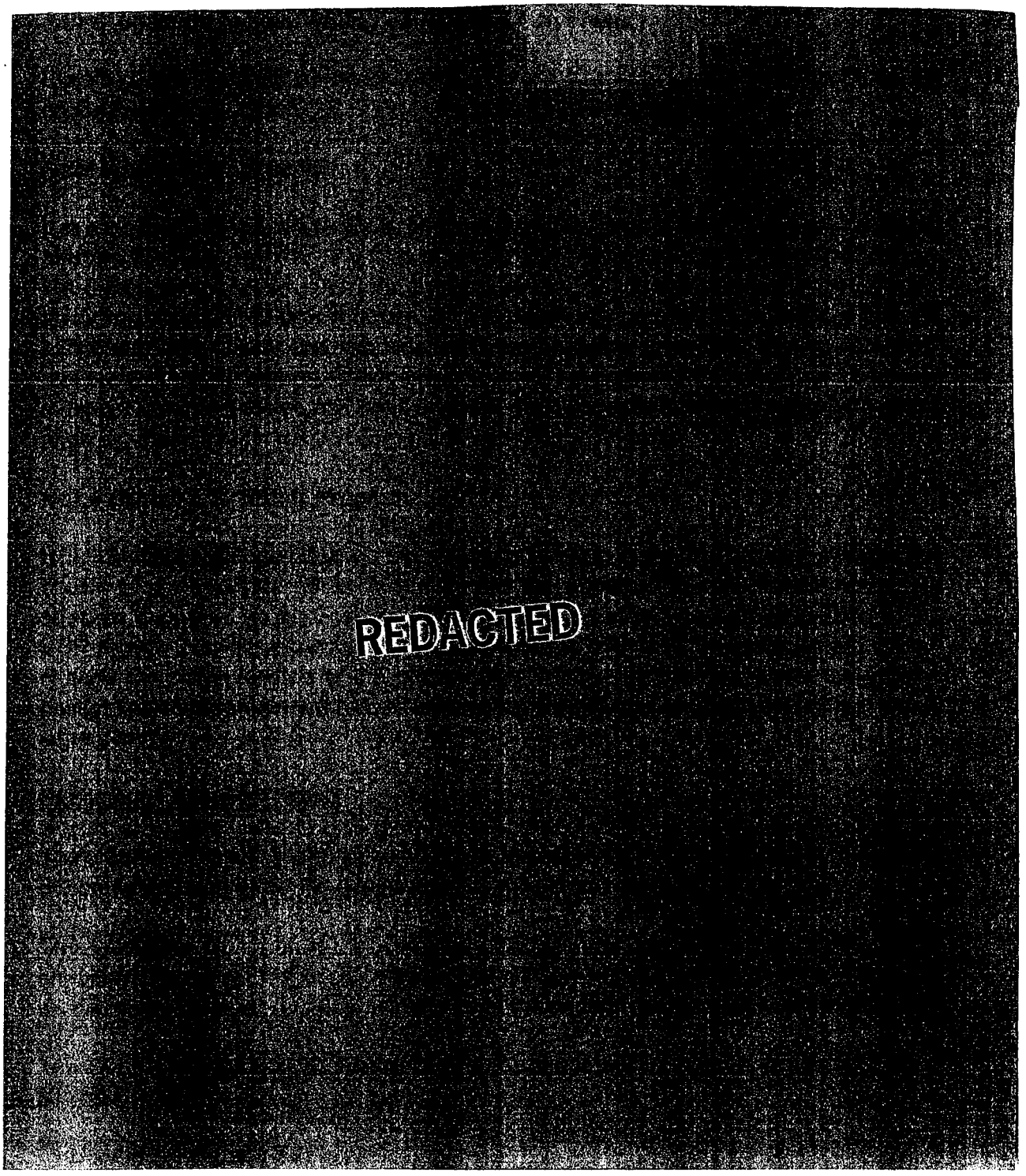
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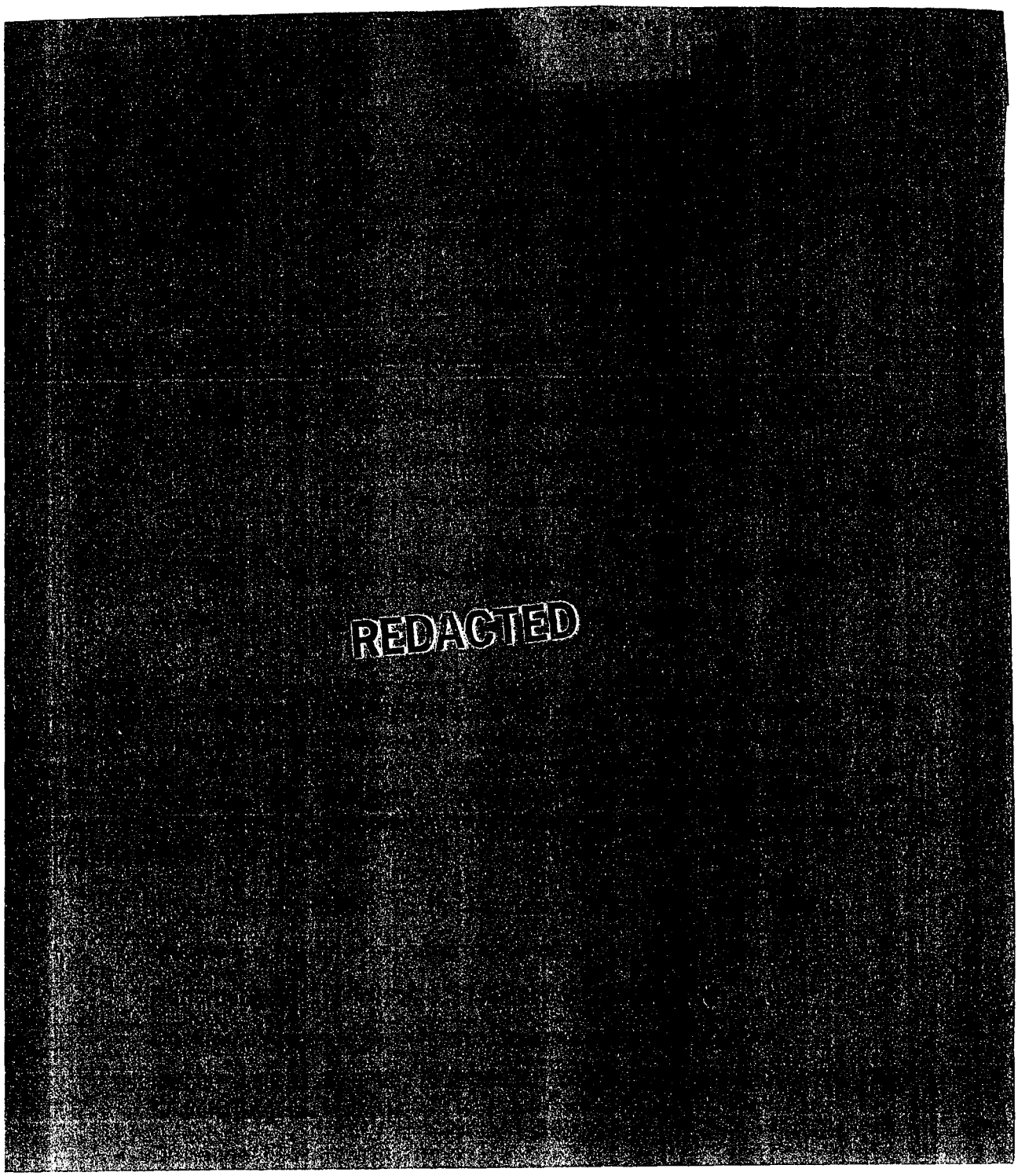
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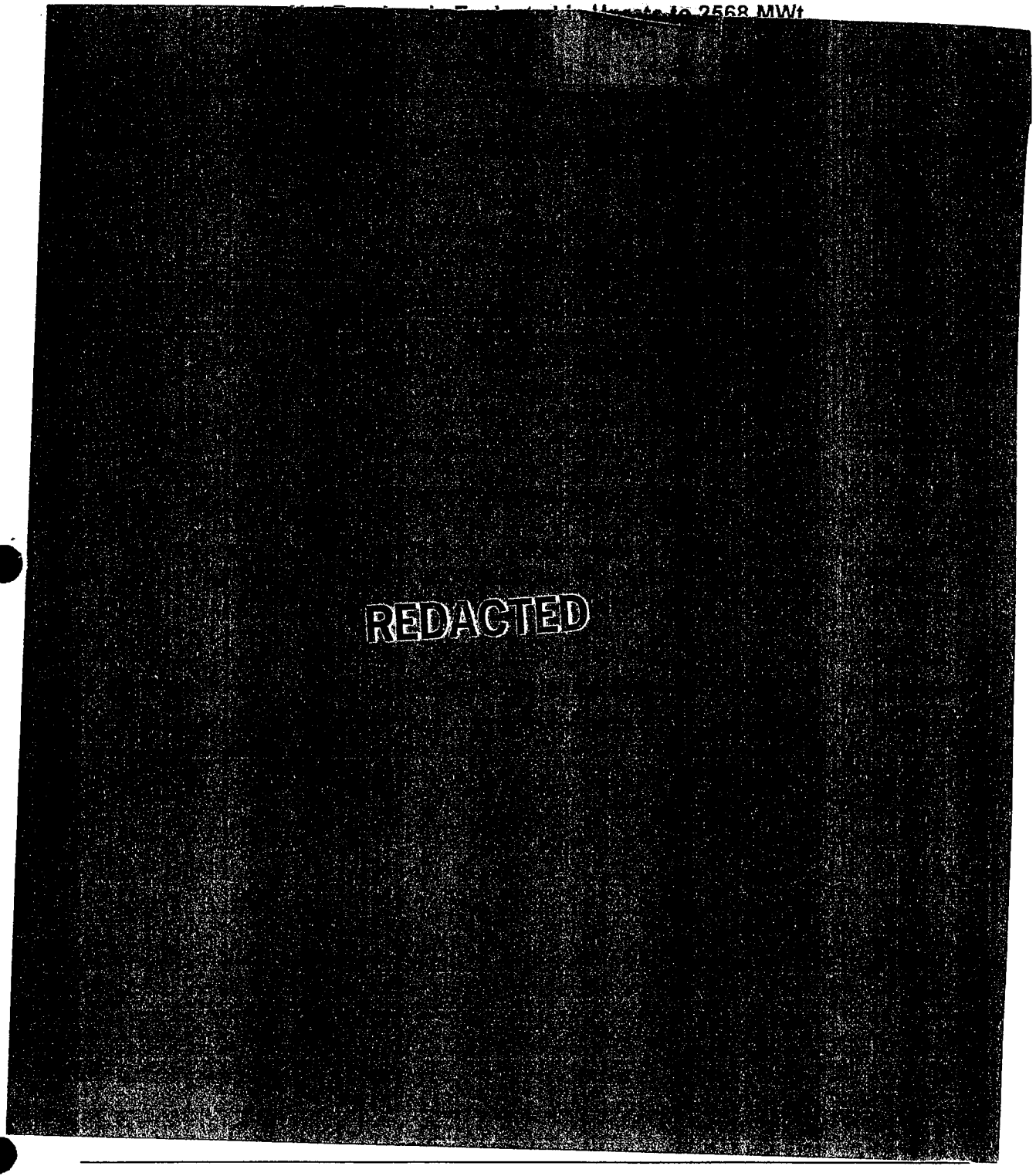
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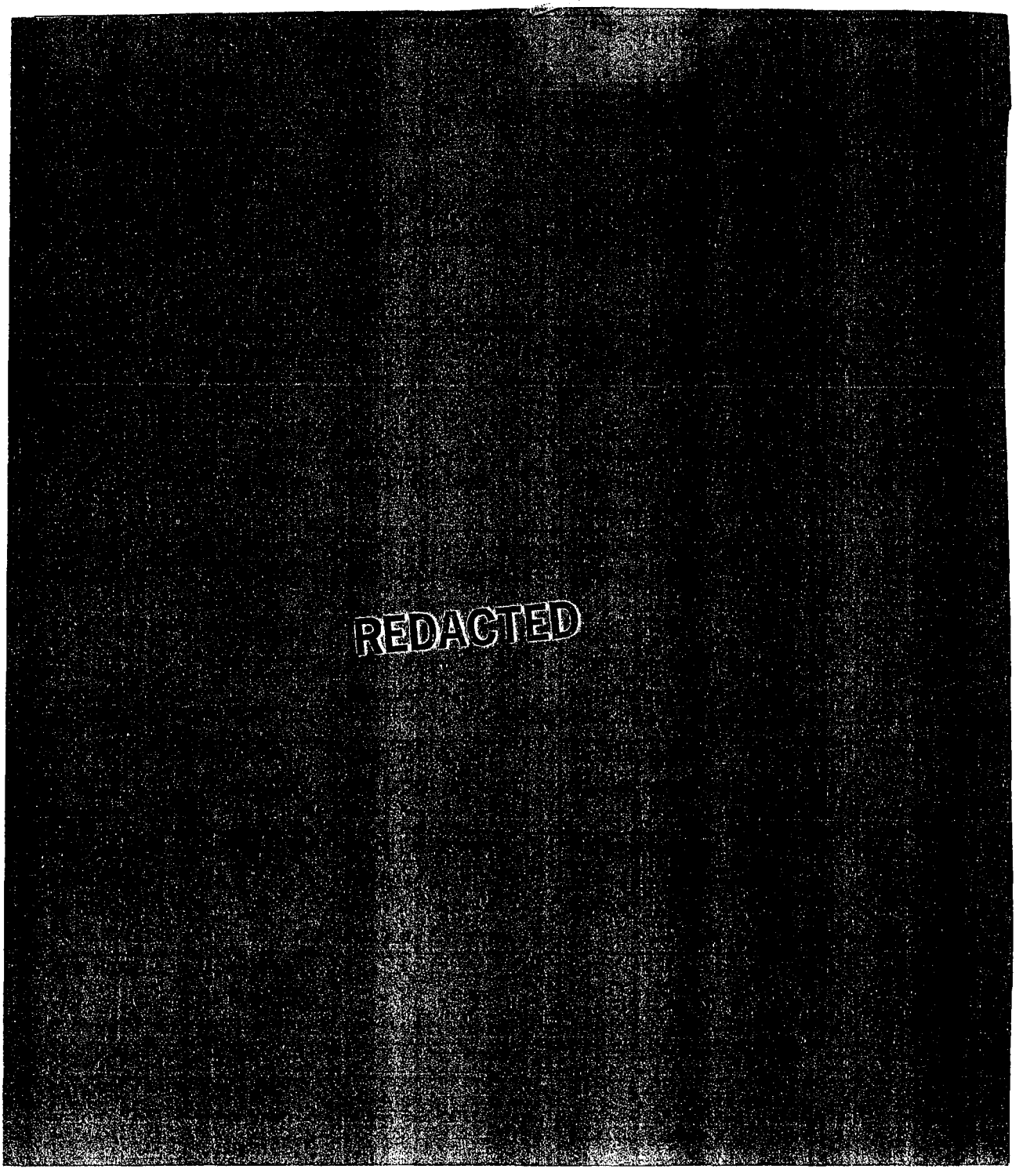
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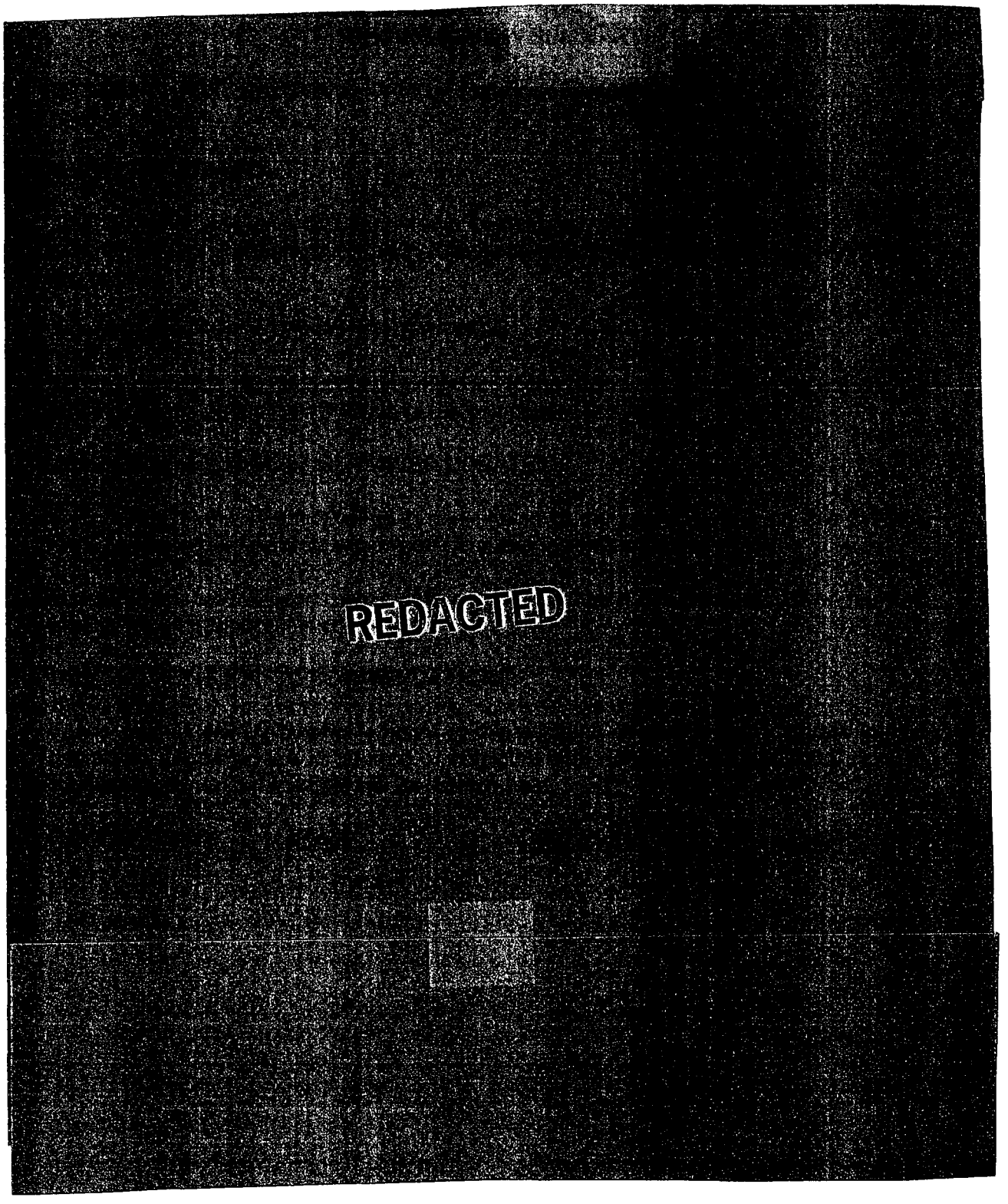
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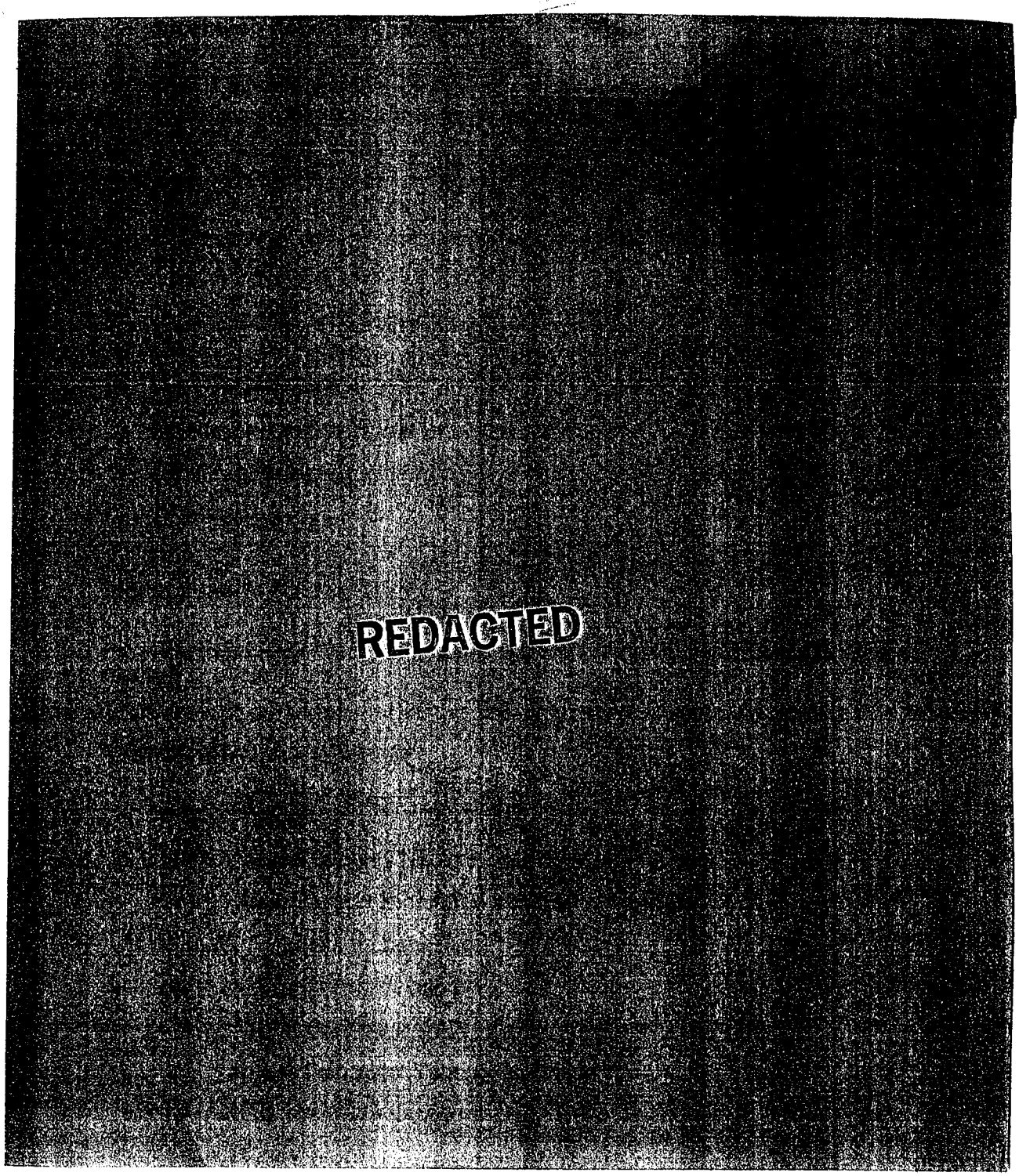
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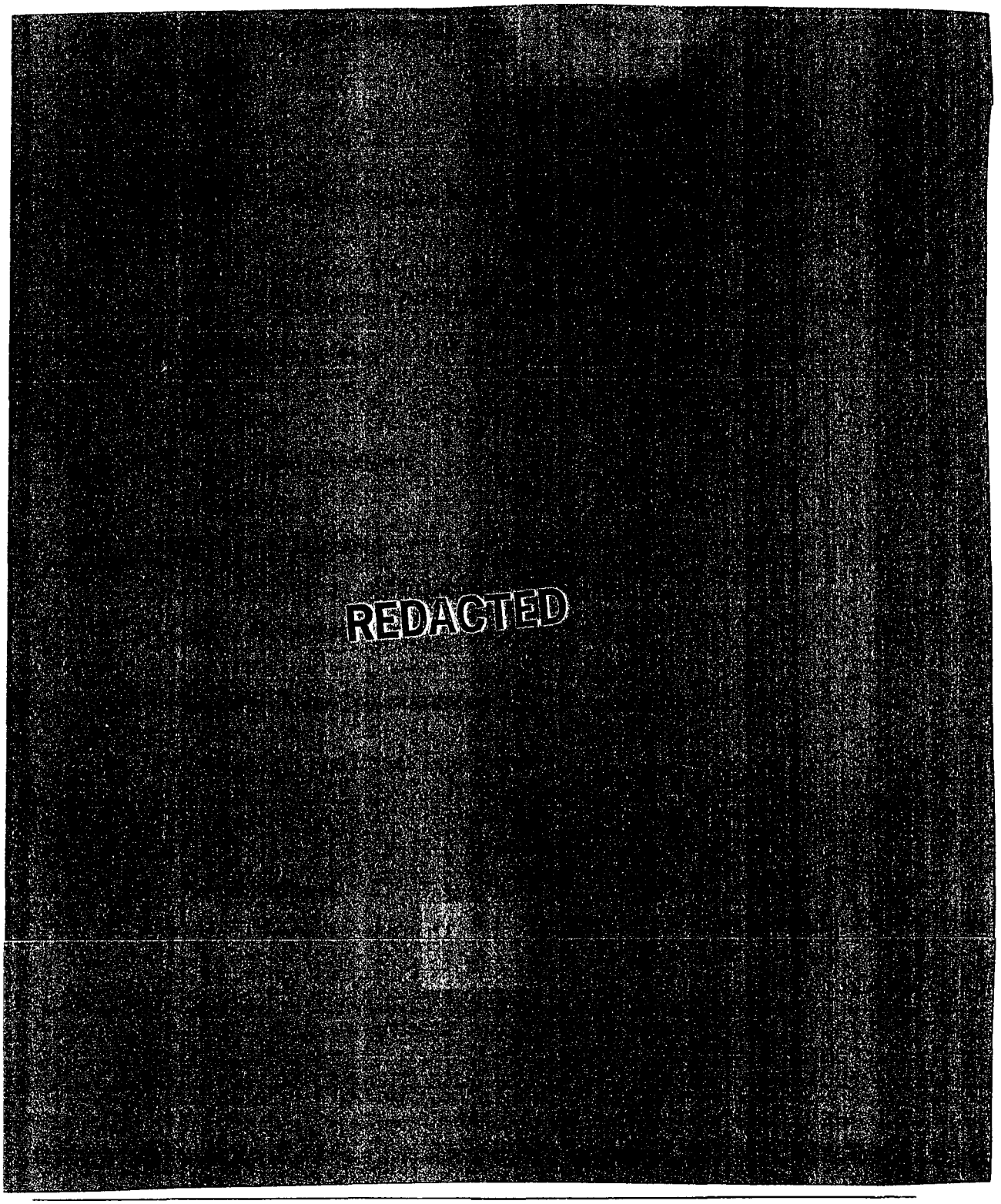
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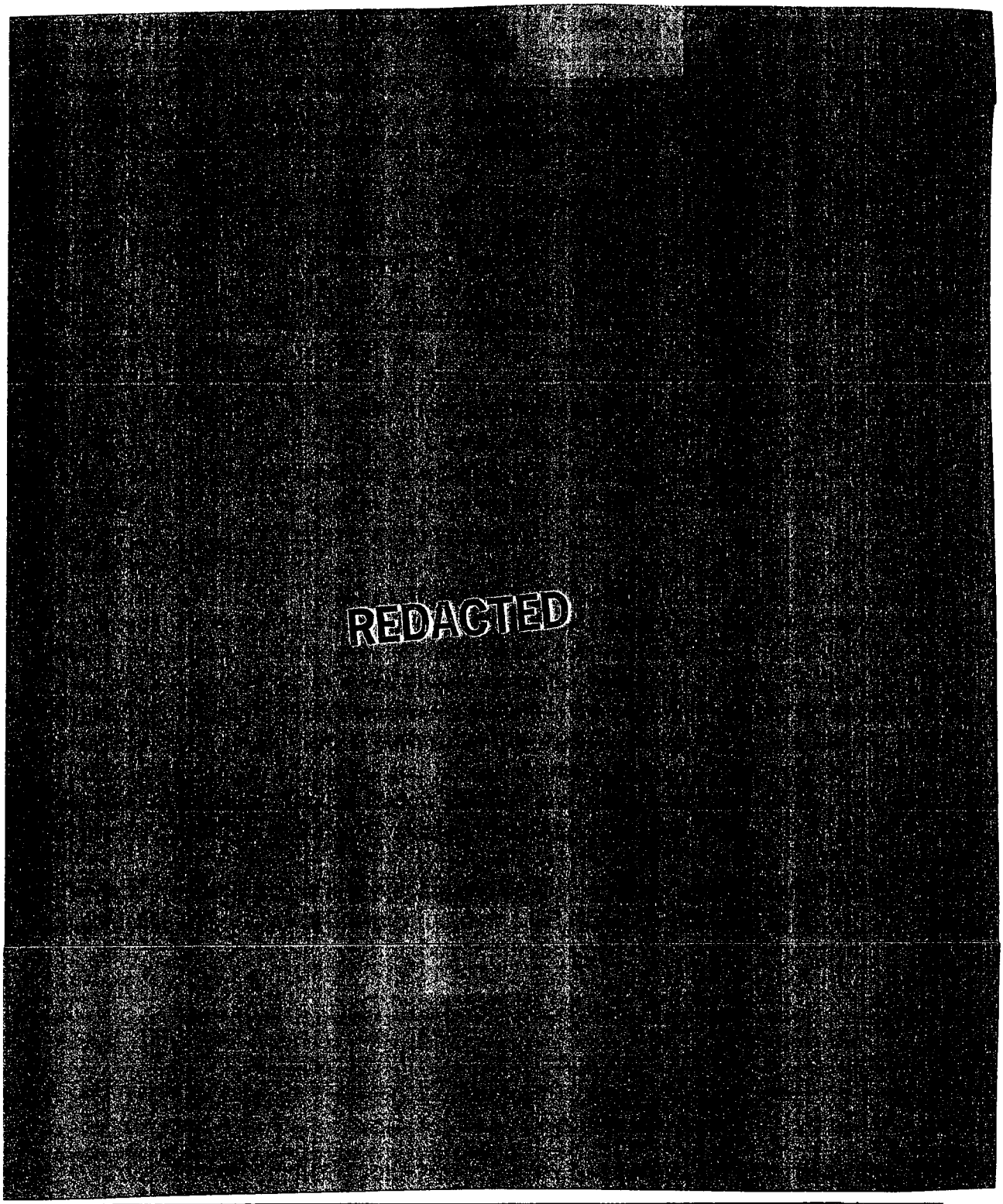
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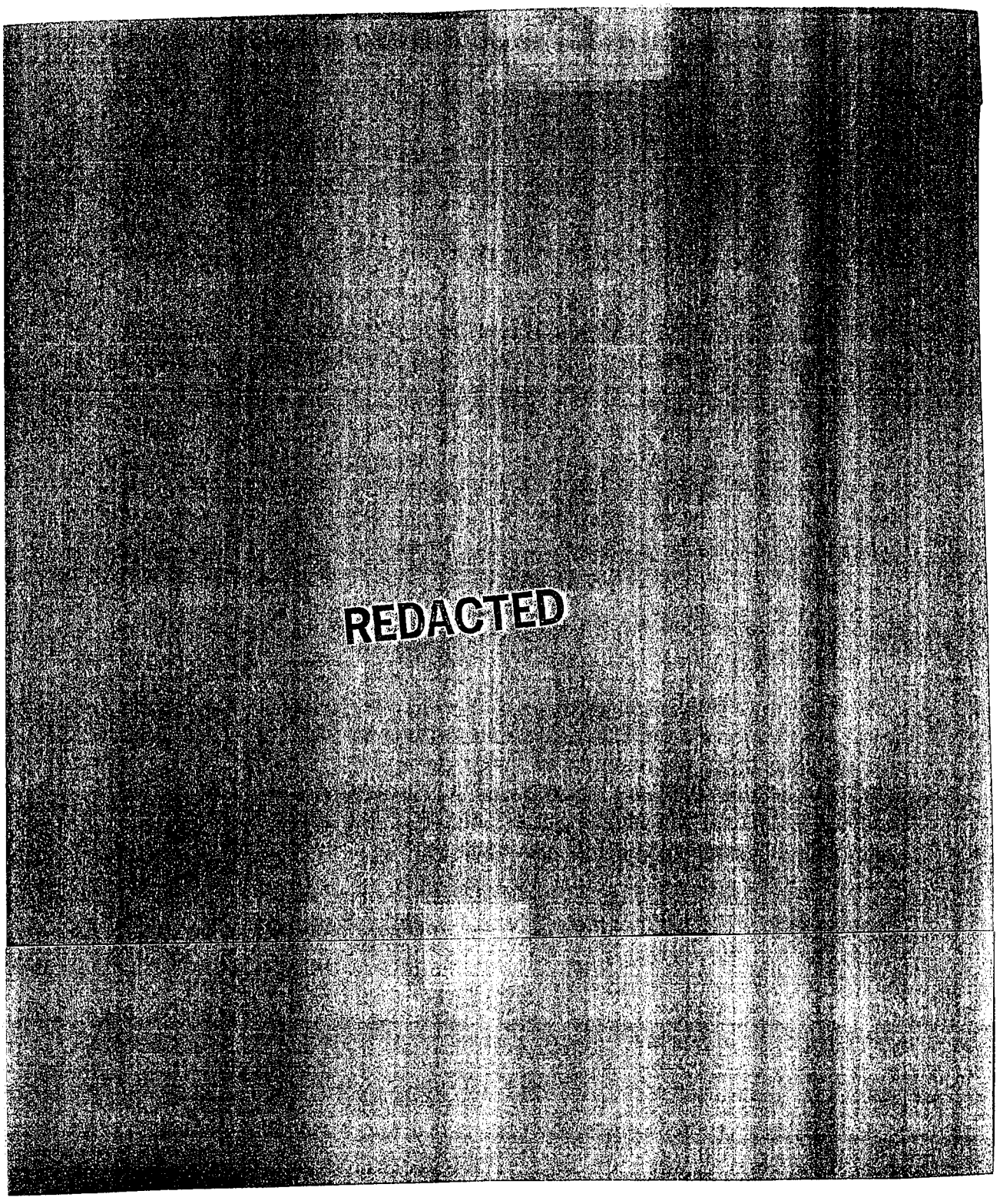
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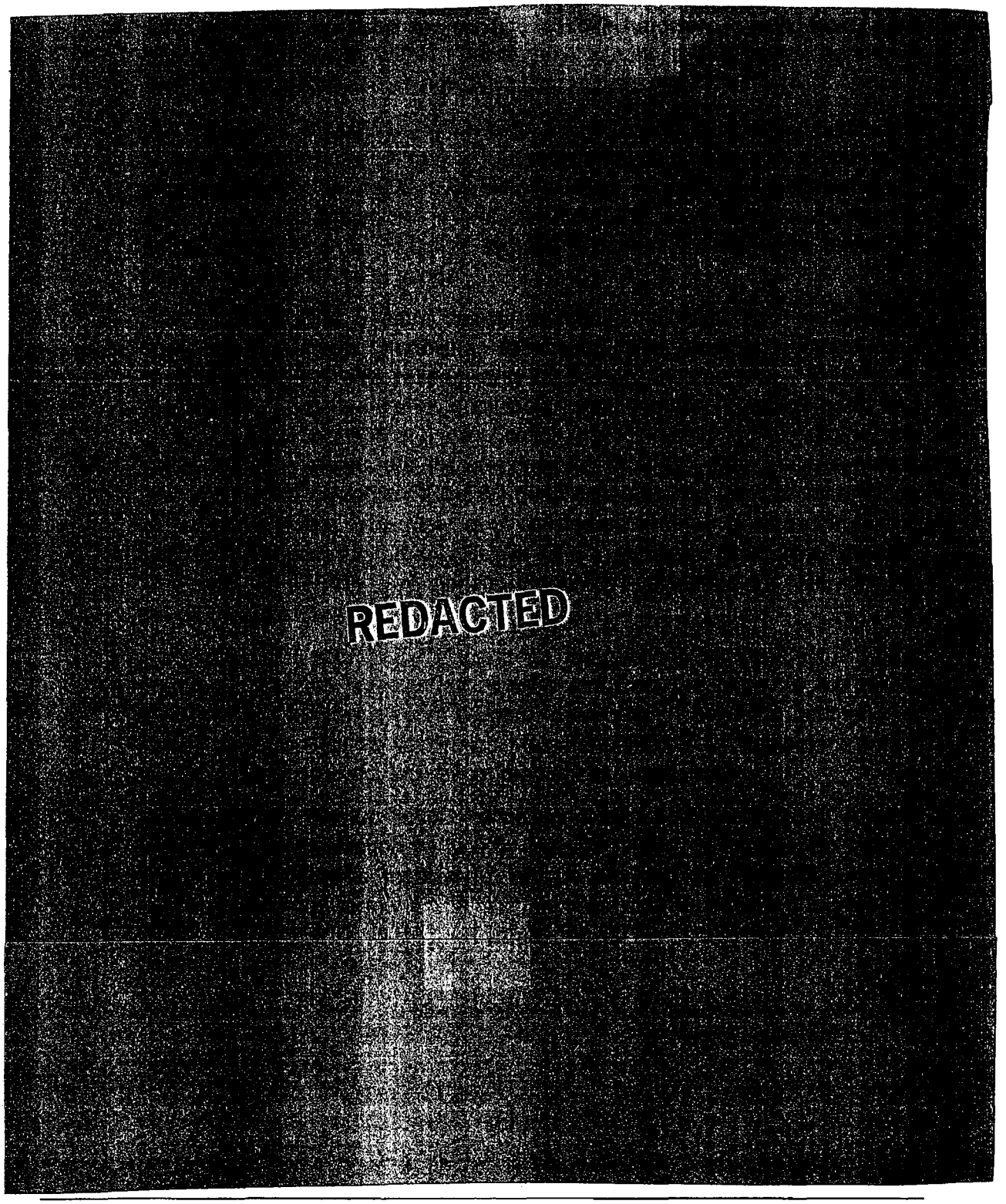
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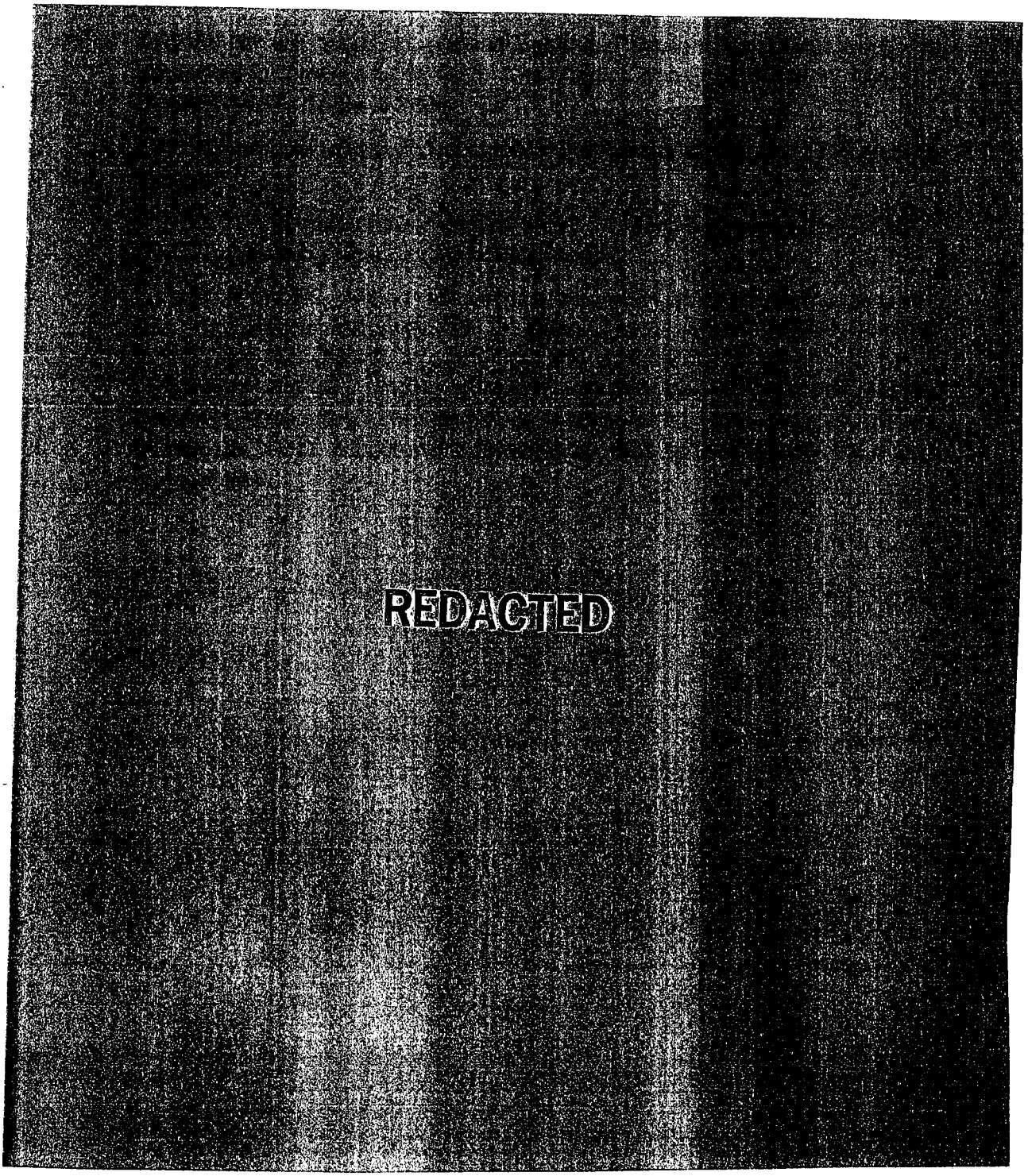
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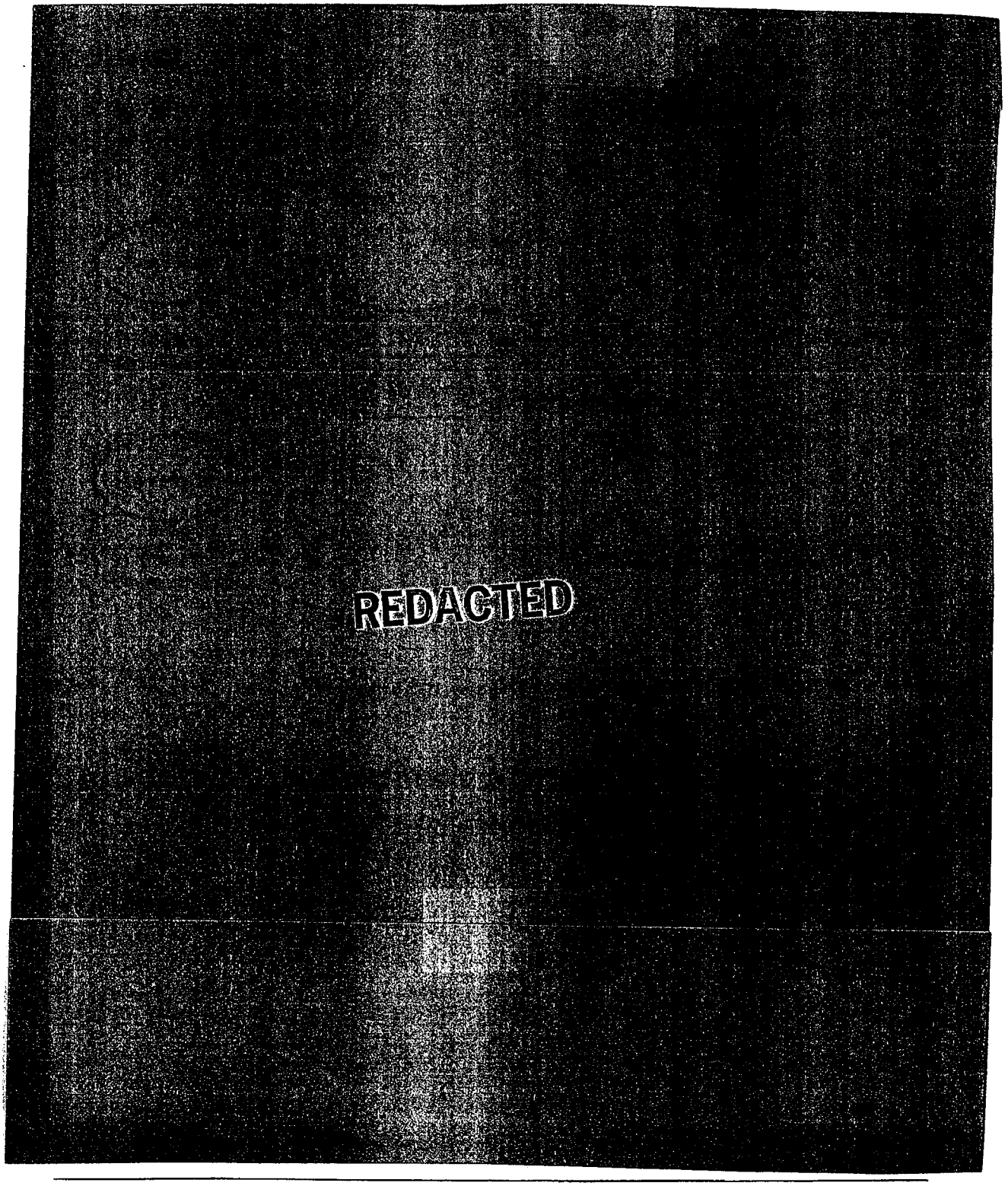
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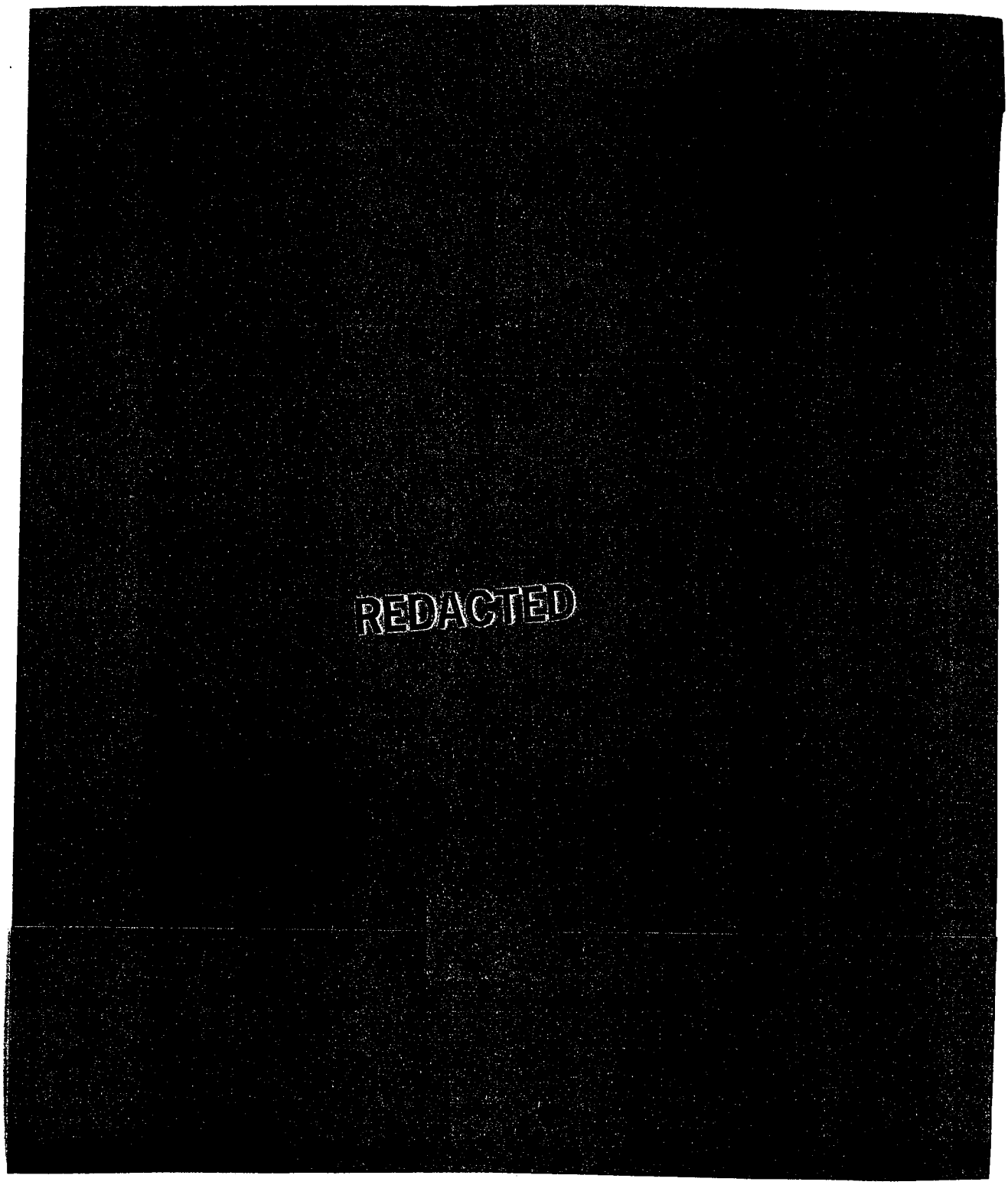
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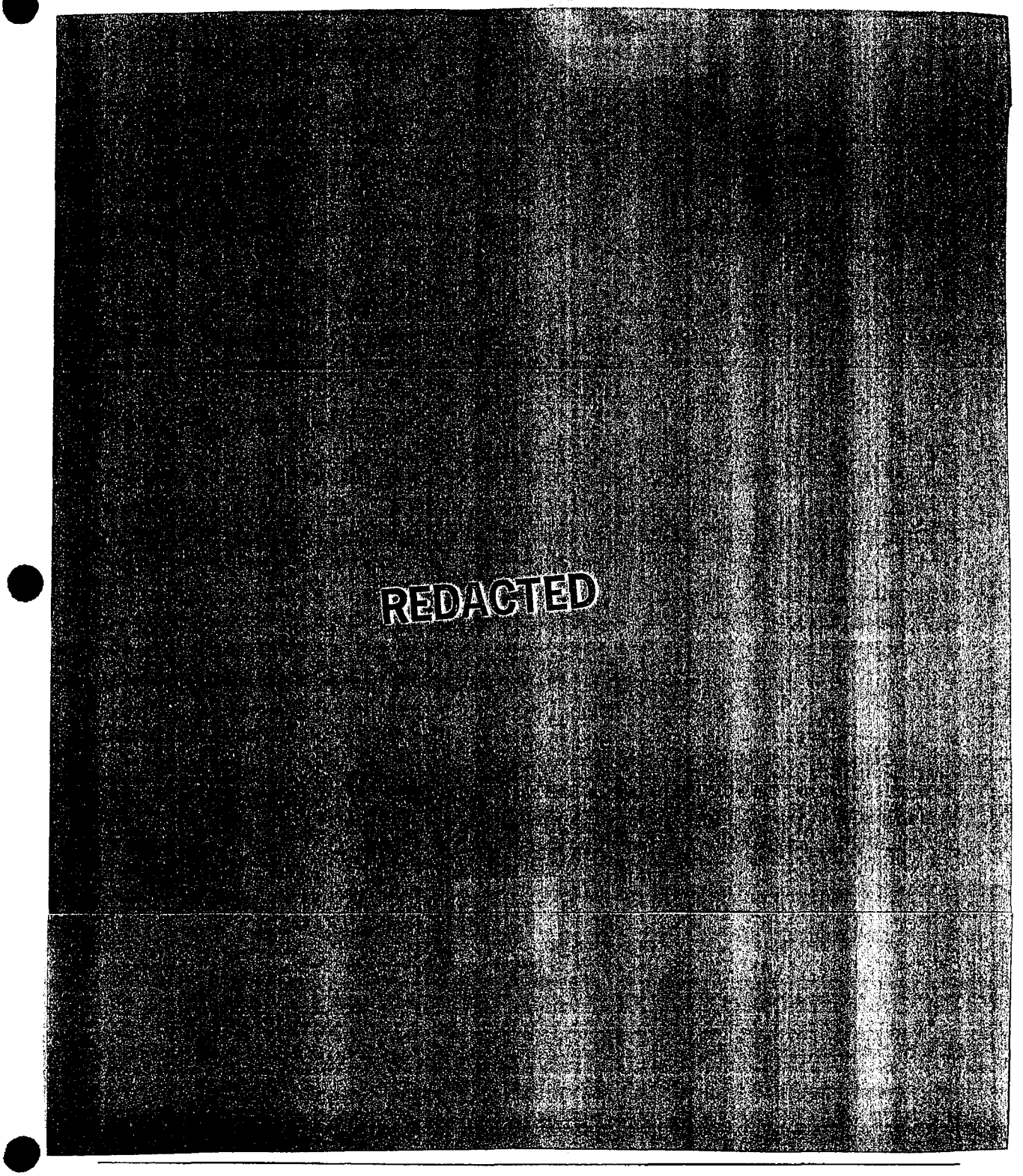
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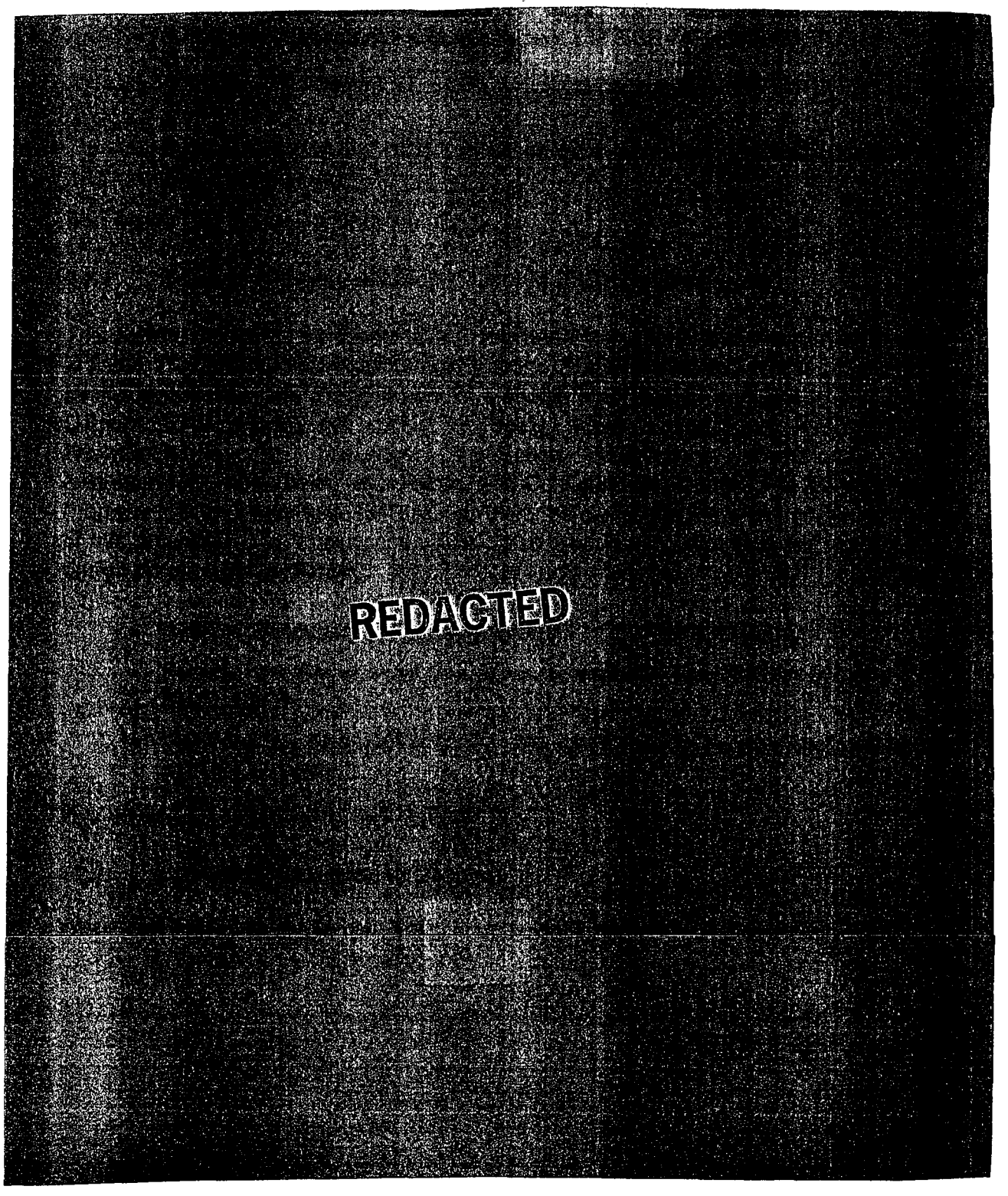
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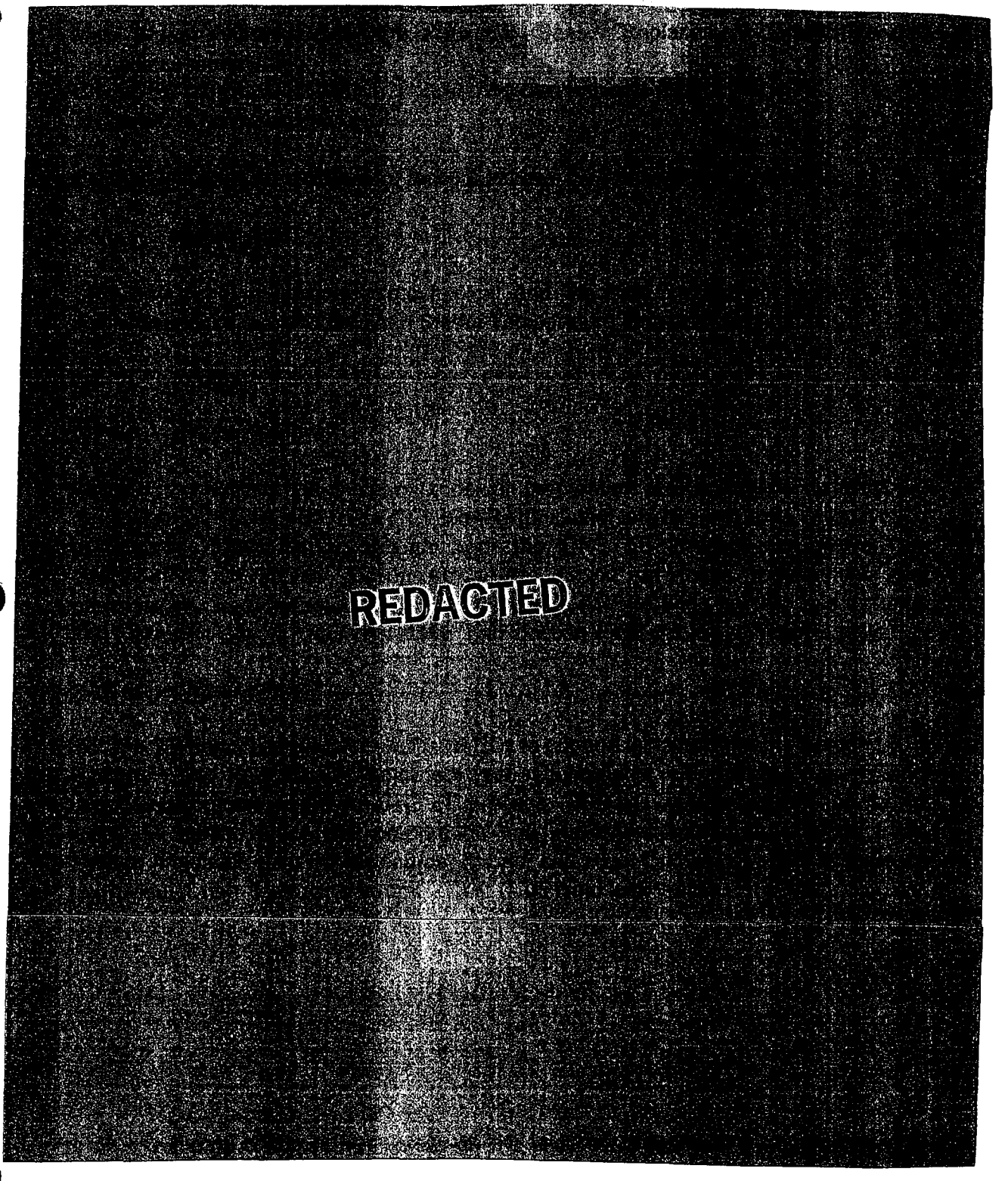
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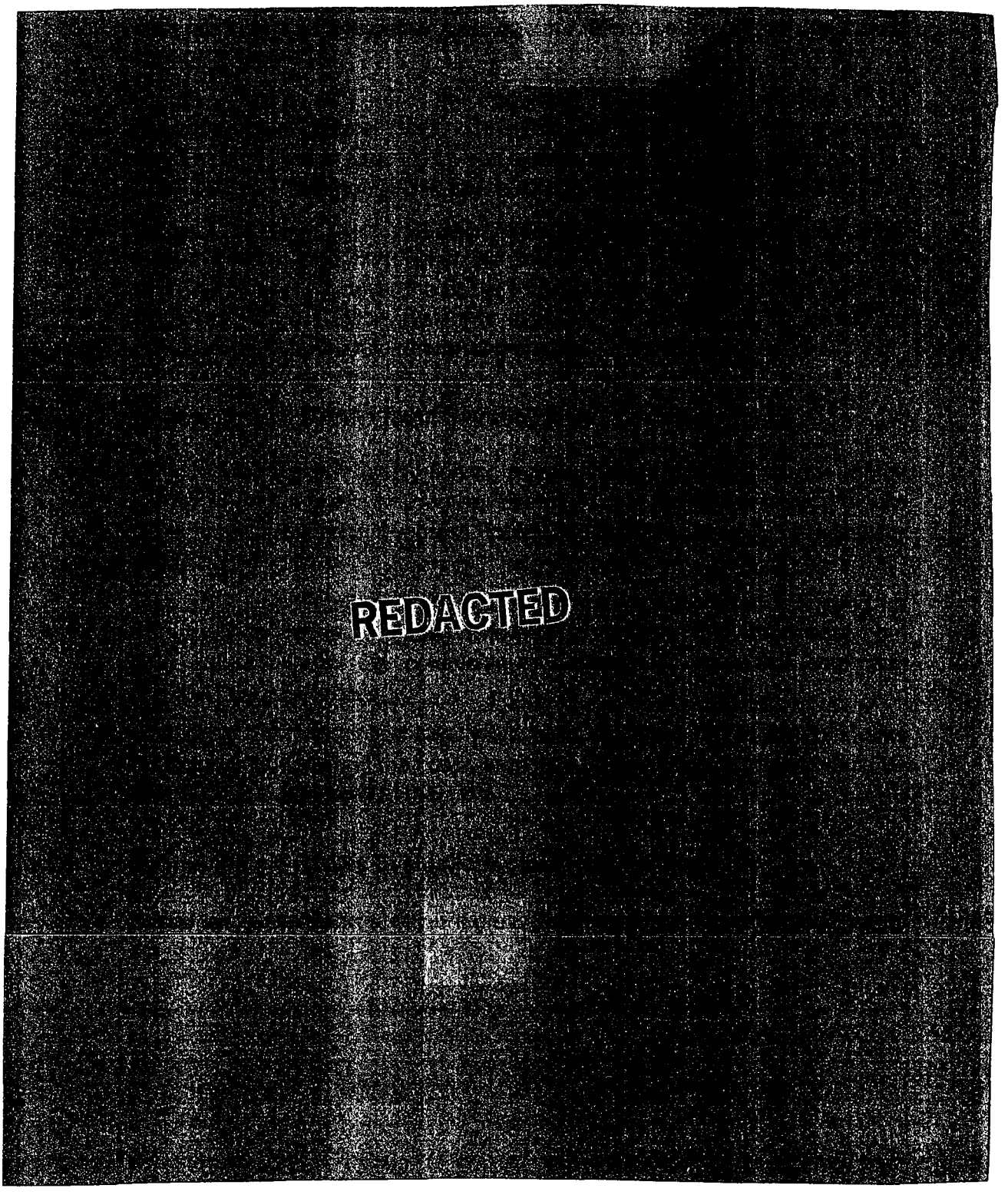
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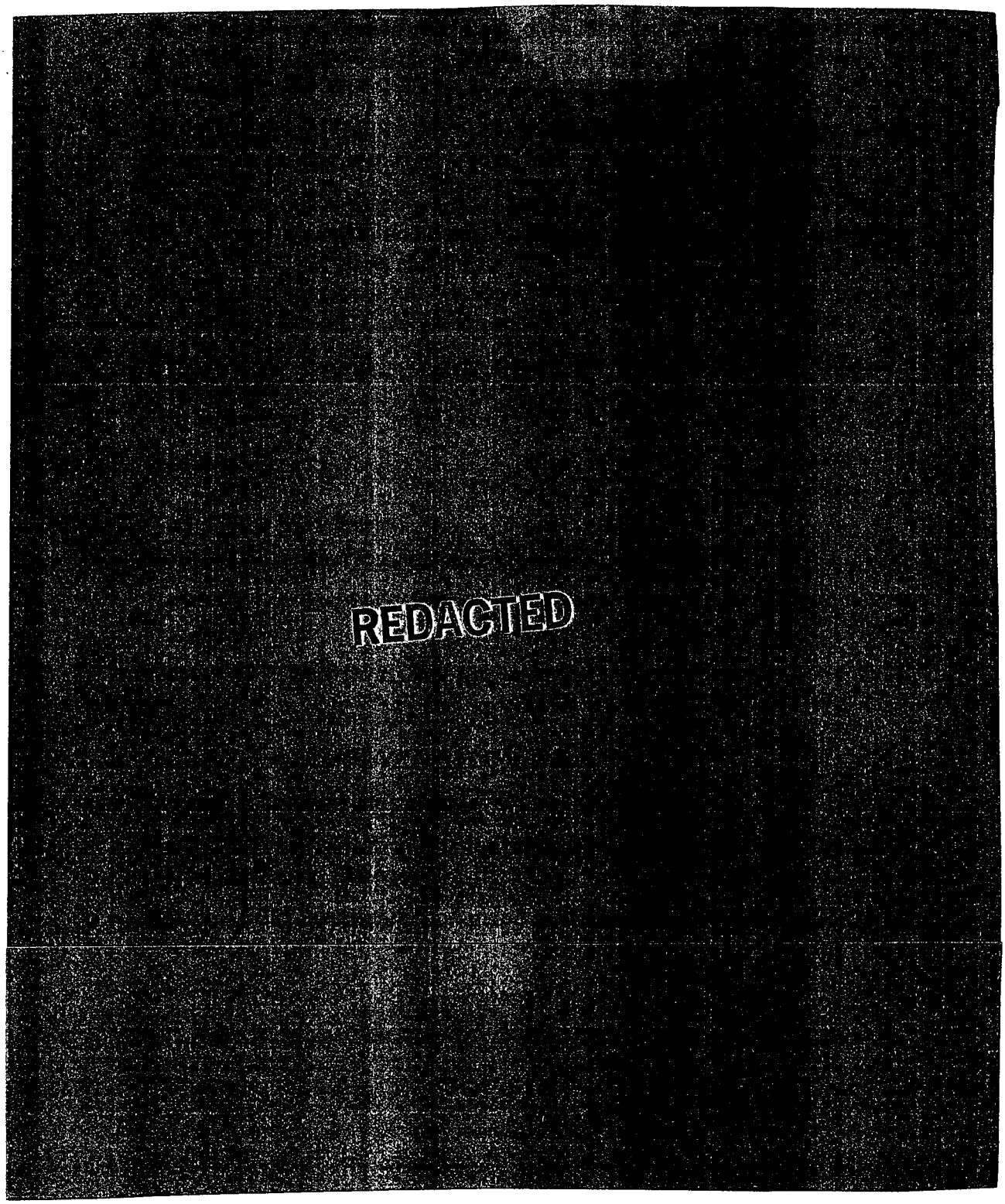
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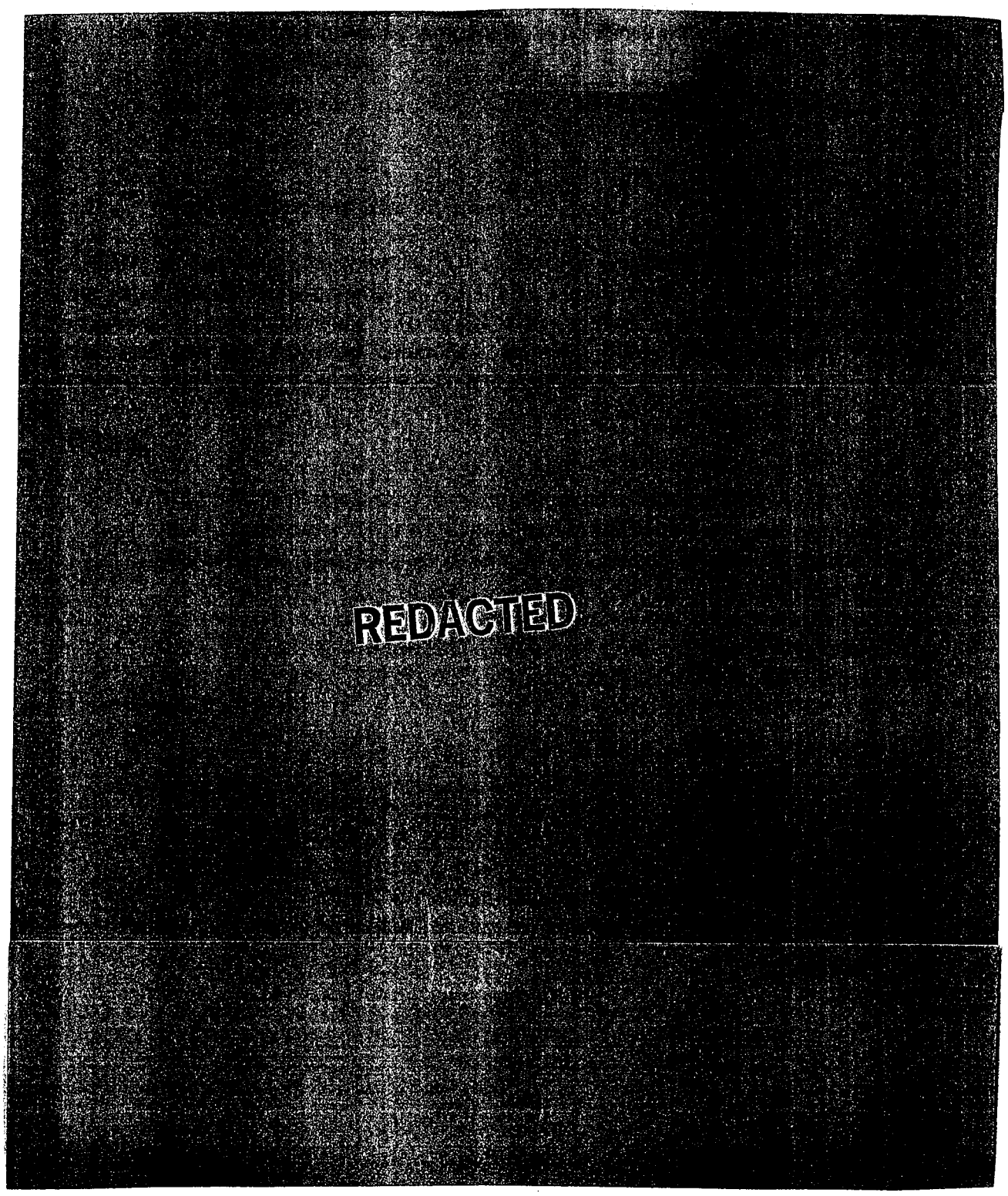
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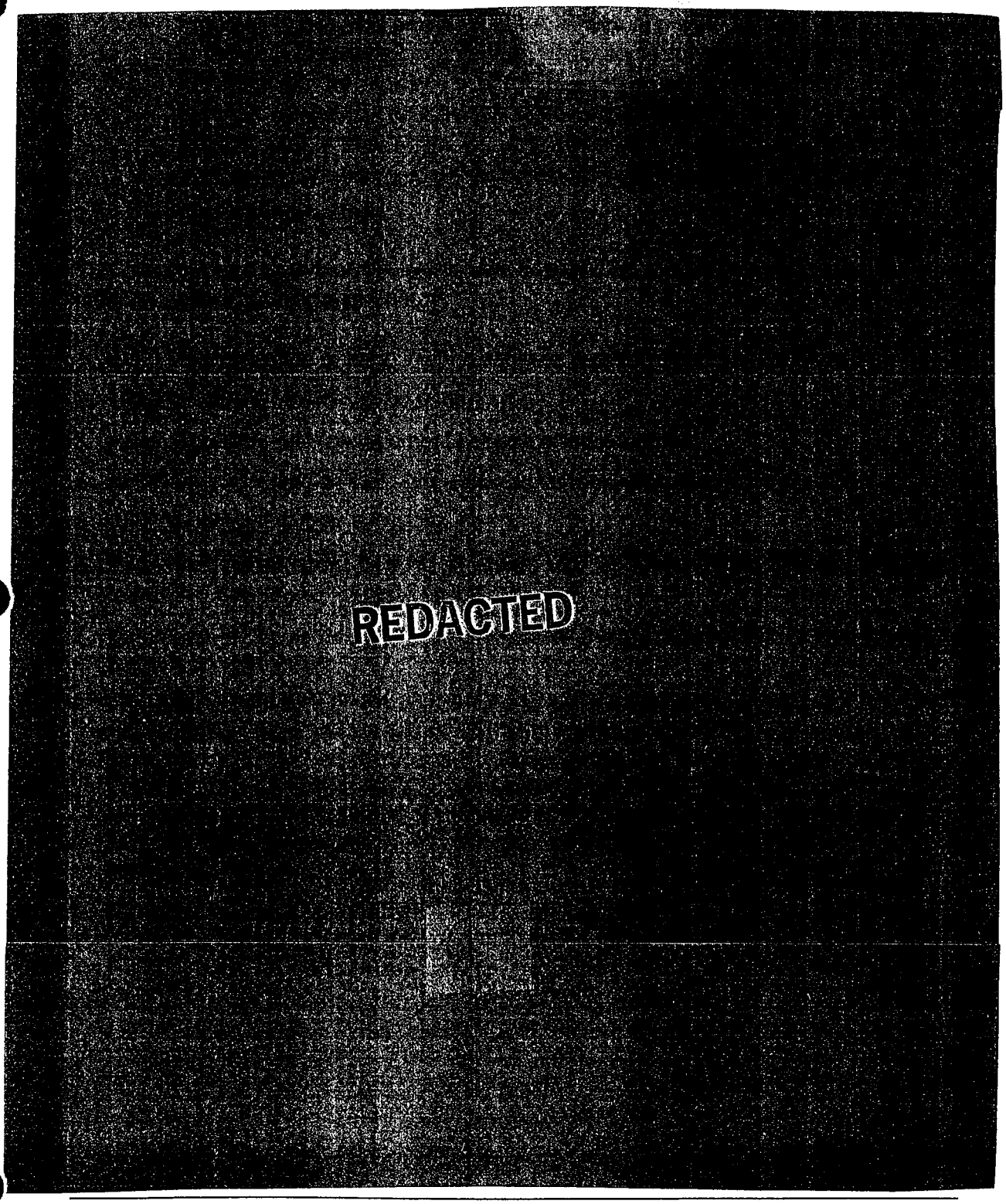
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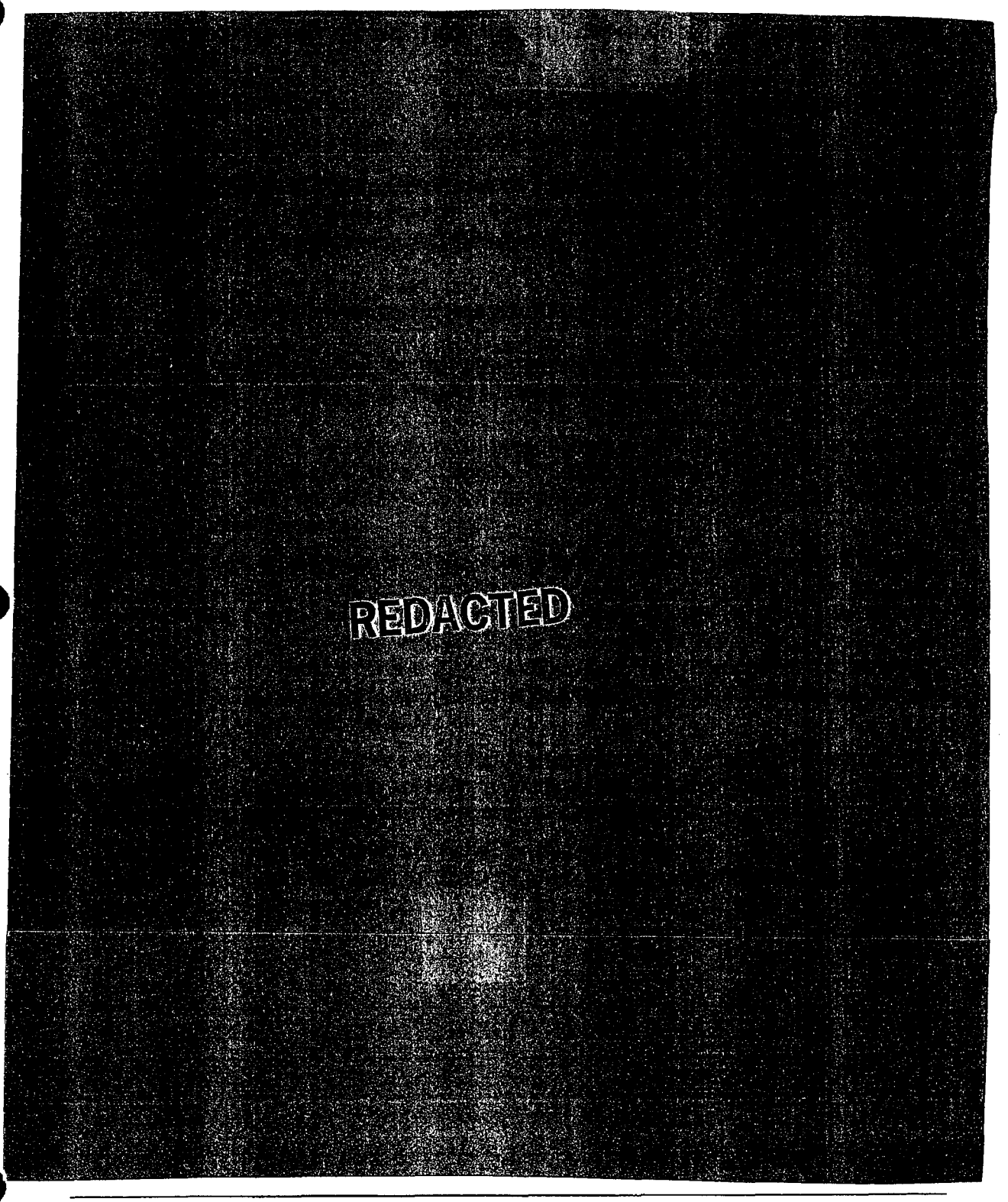

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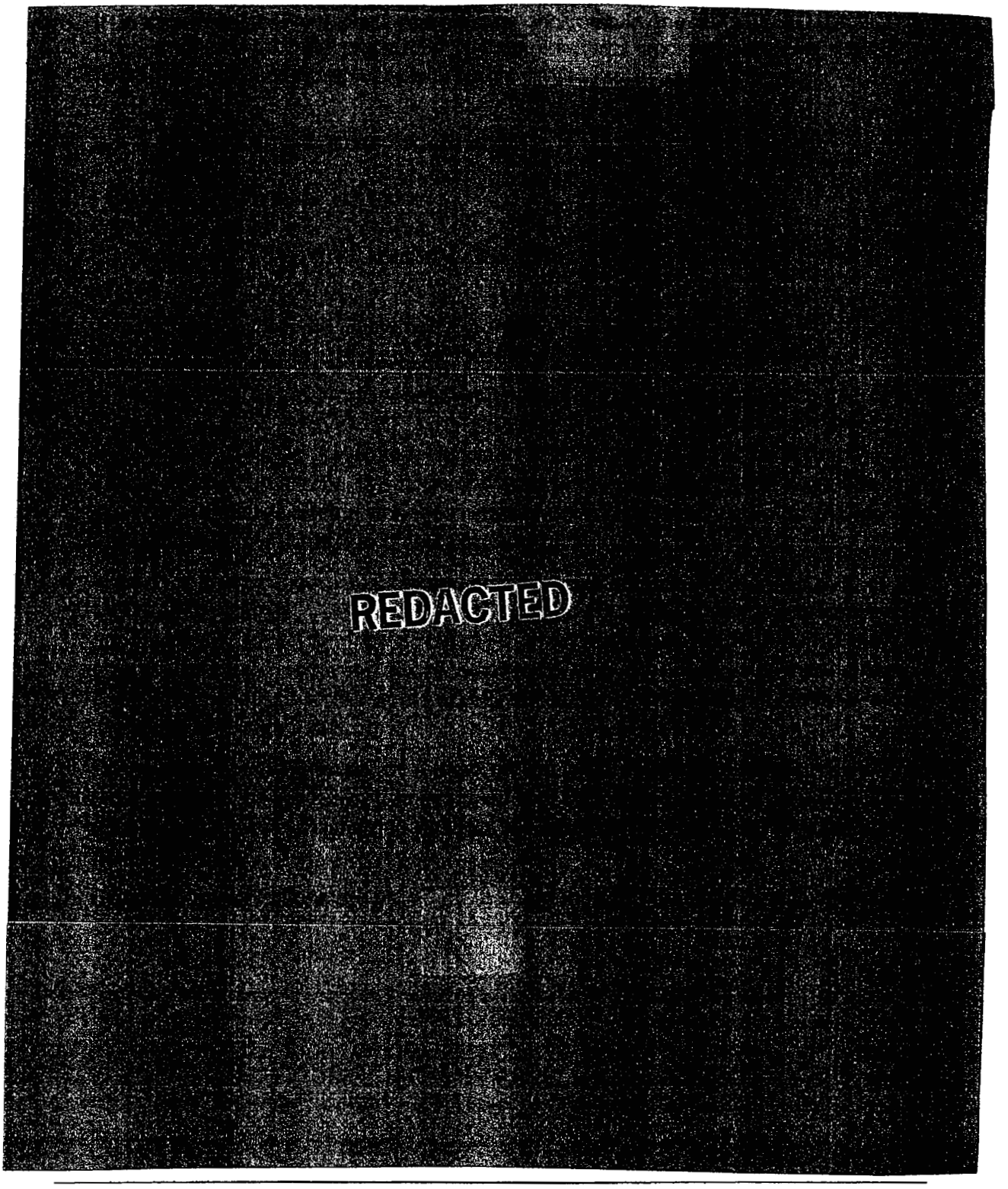
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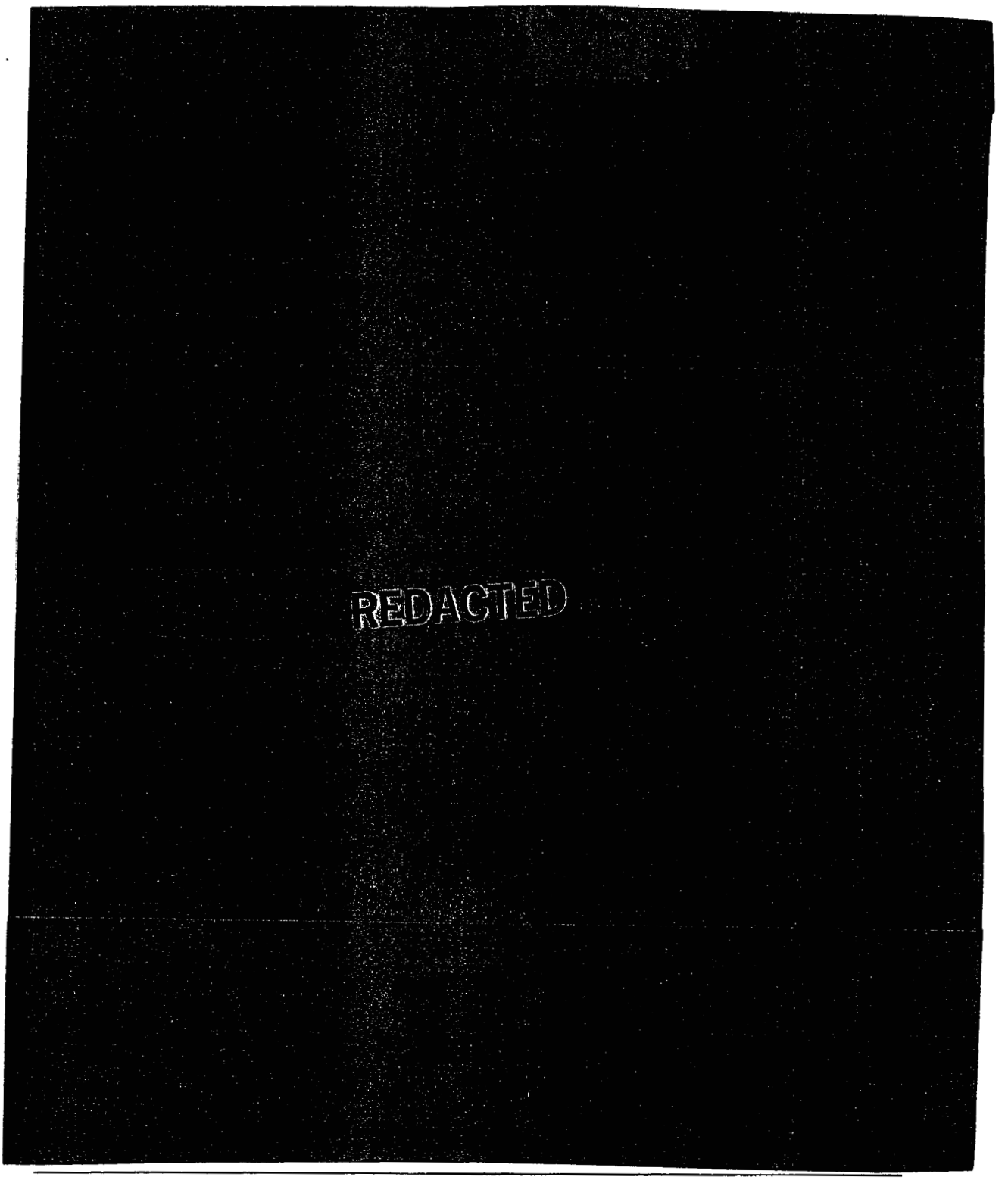

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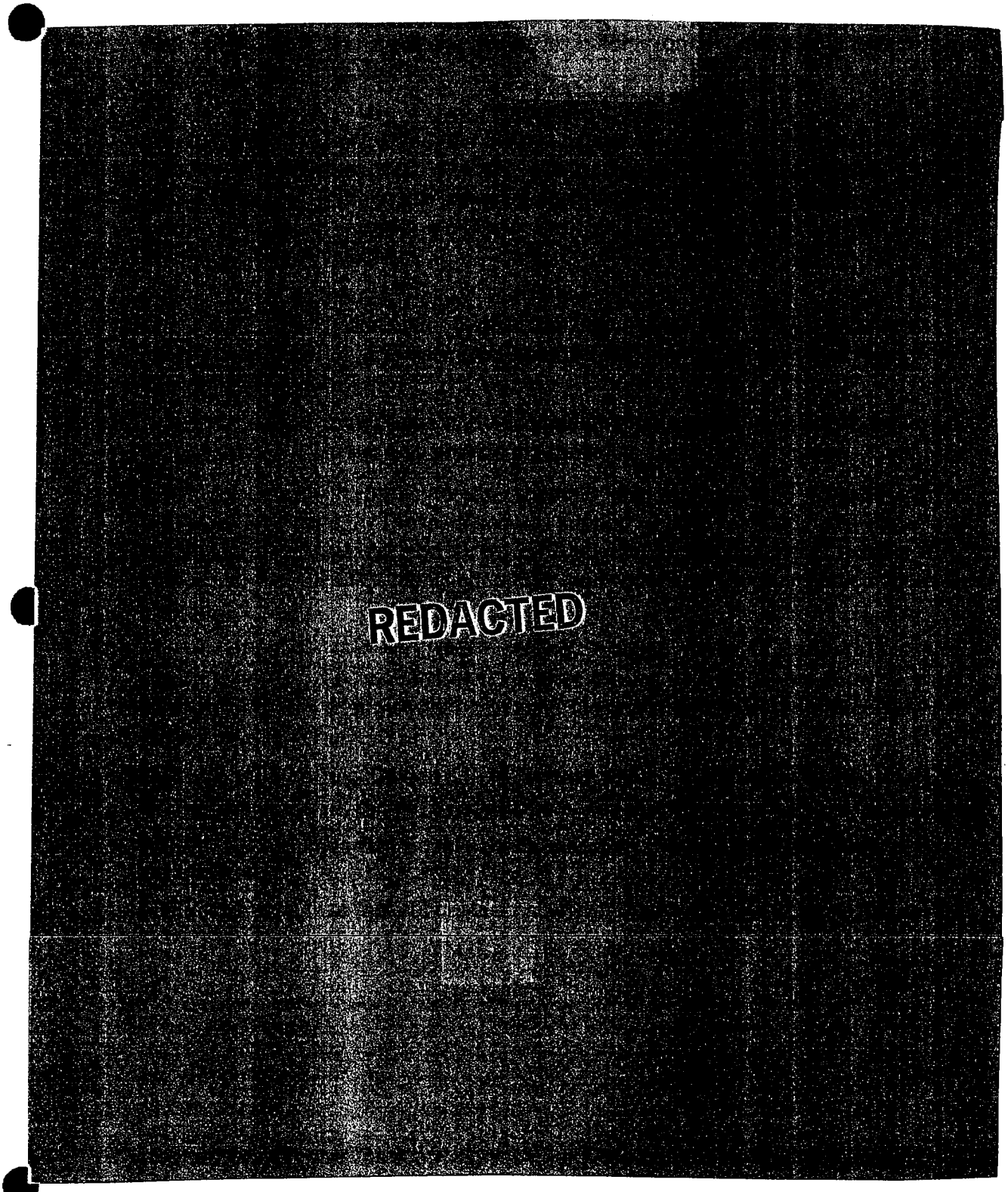
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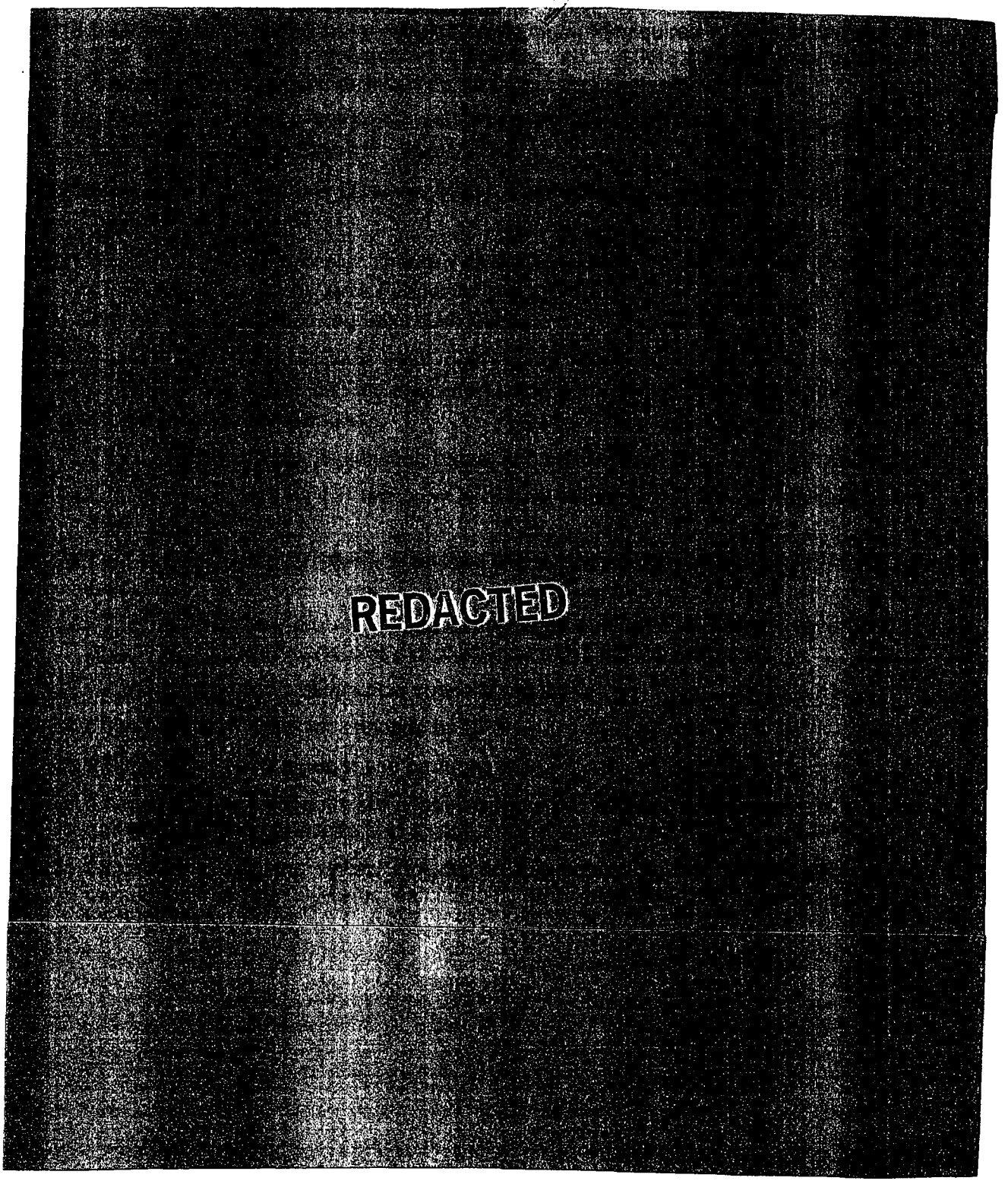
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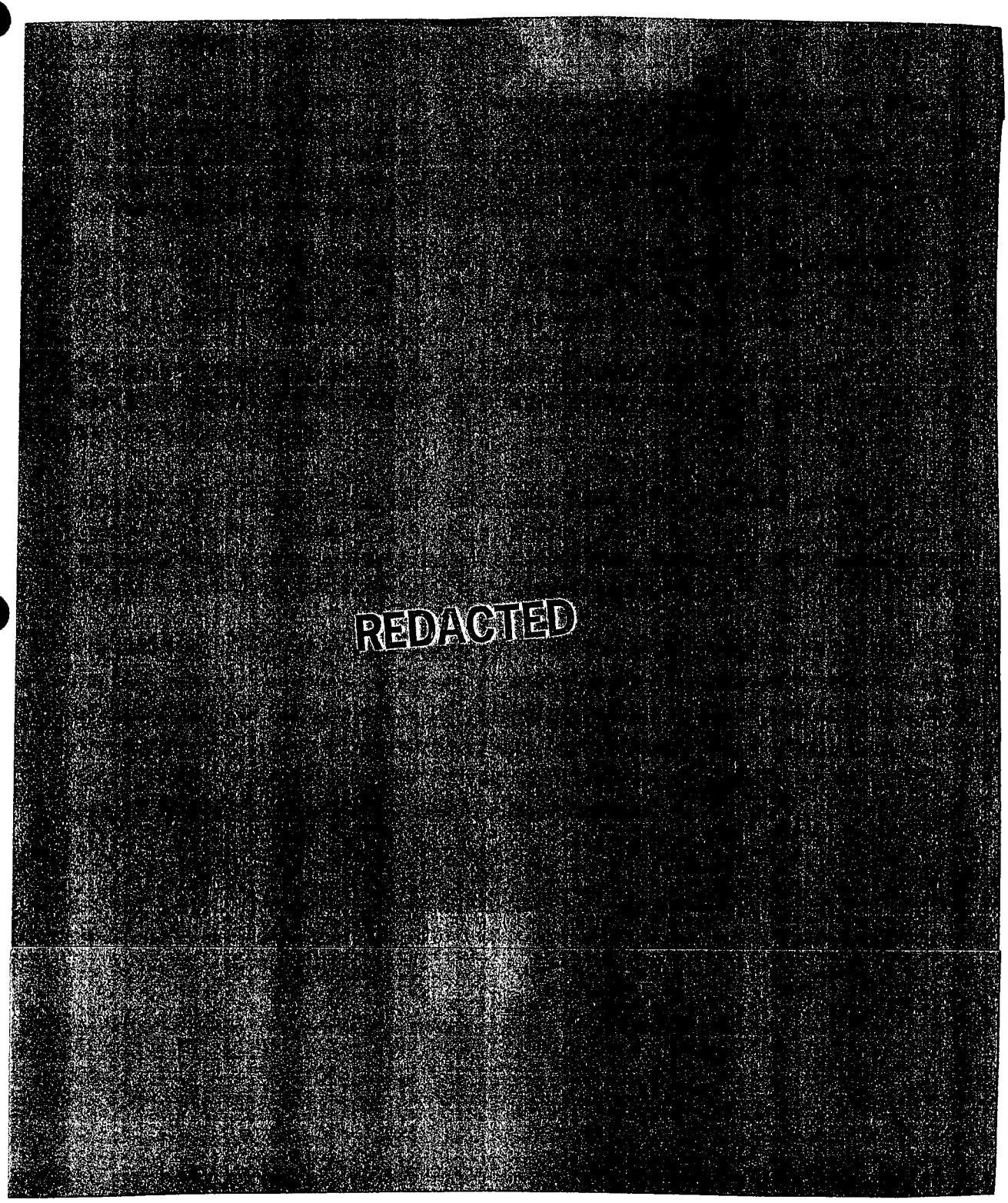
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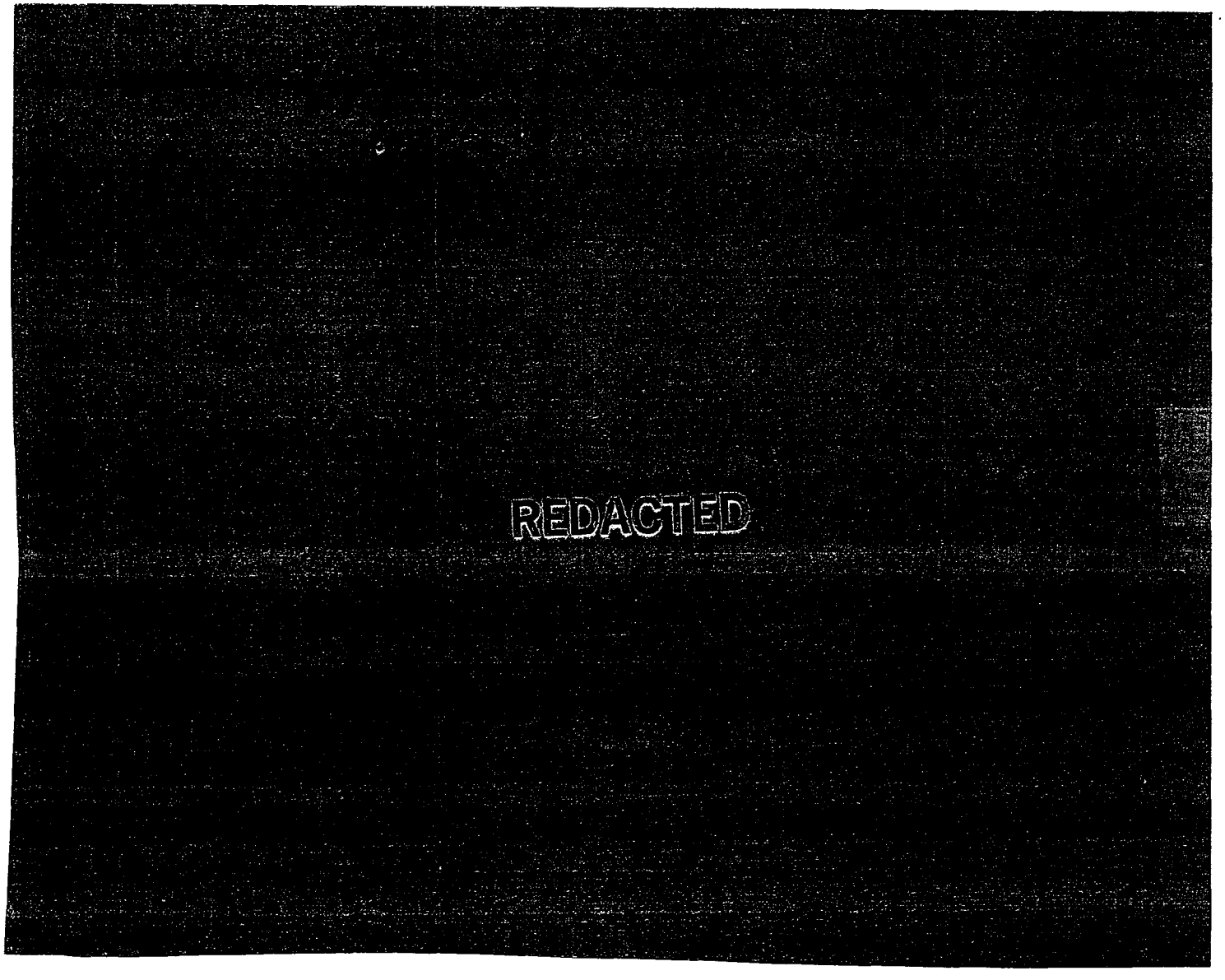
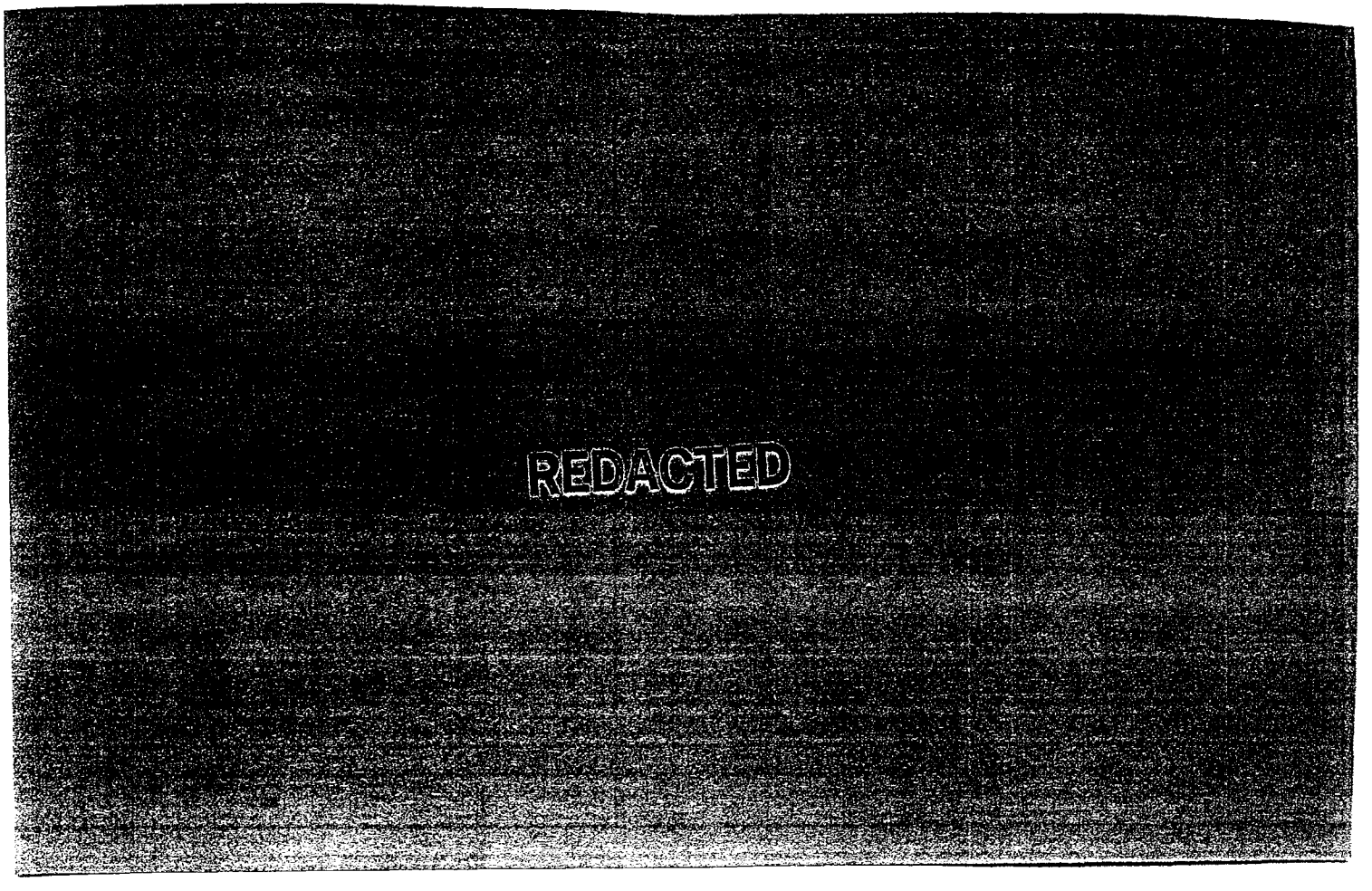


PEF-NCR-00047

Figure 3 – MUR Milestone Schedule



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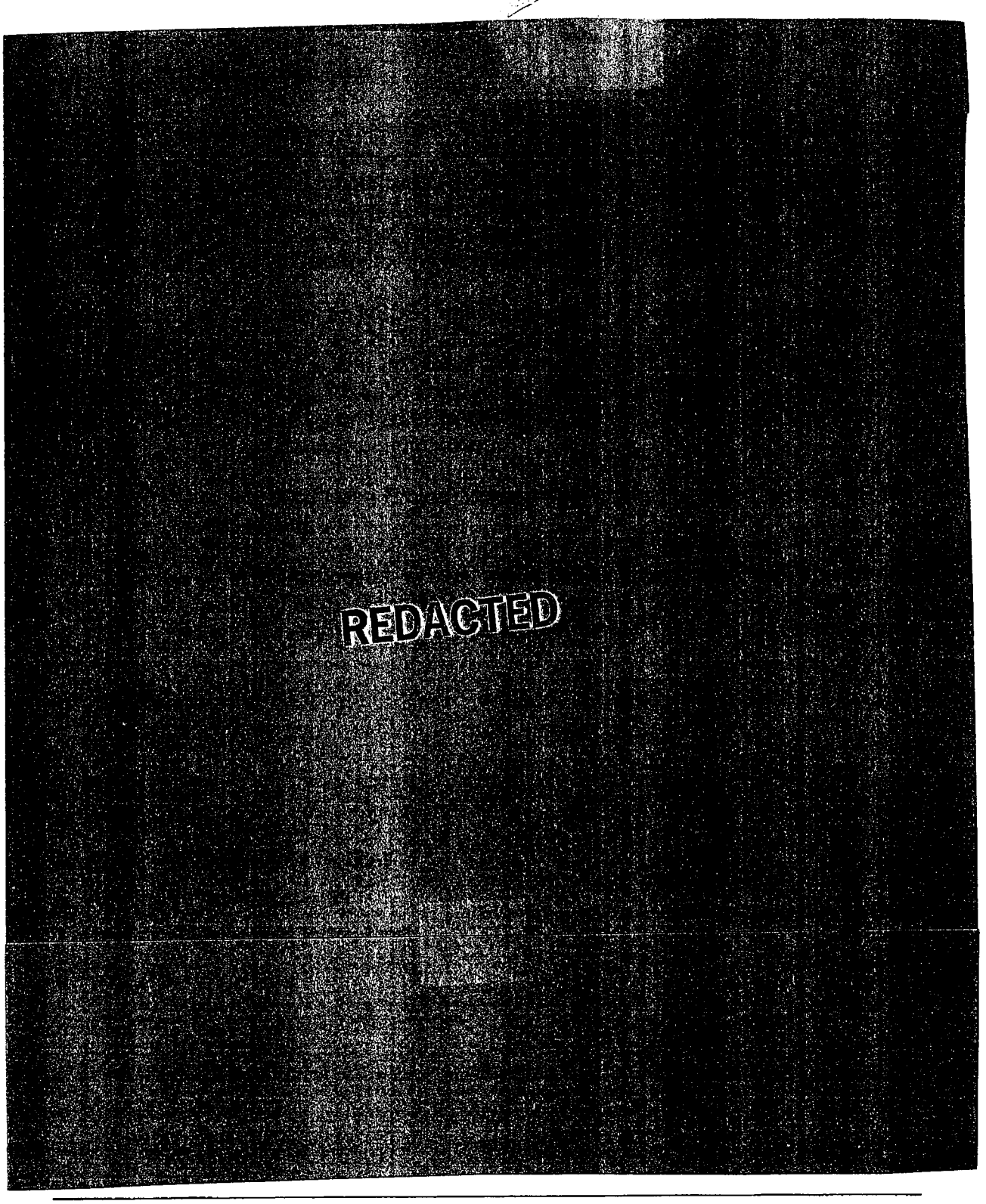
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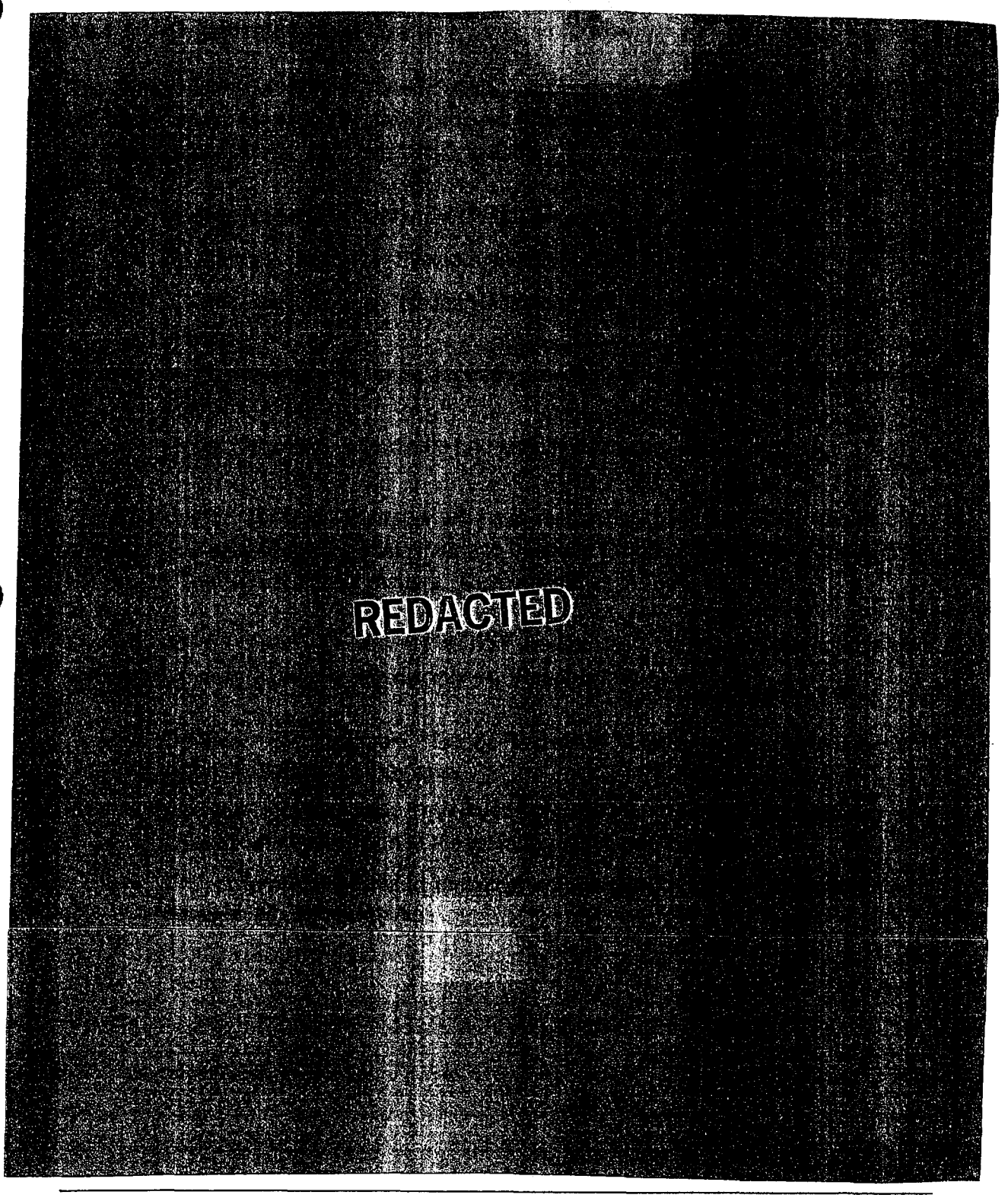
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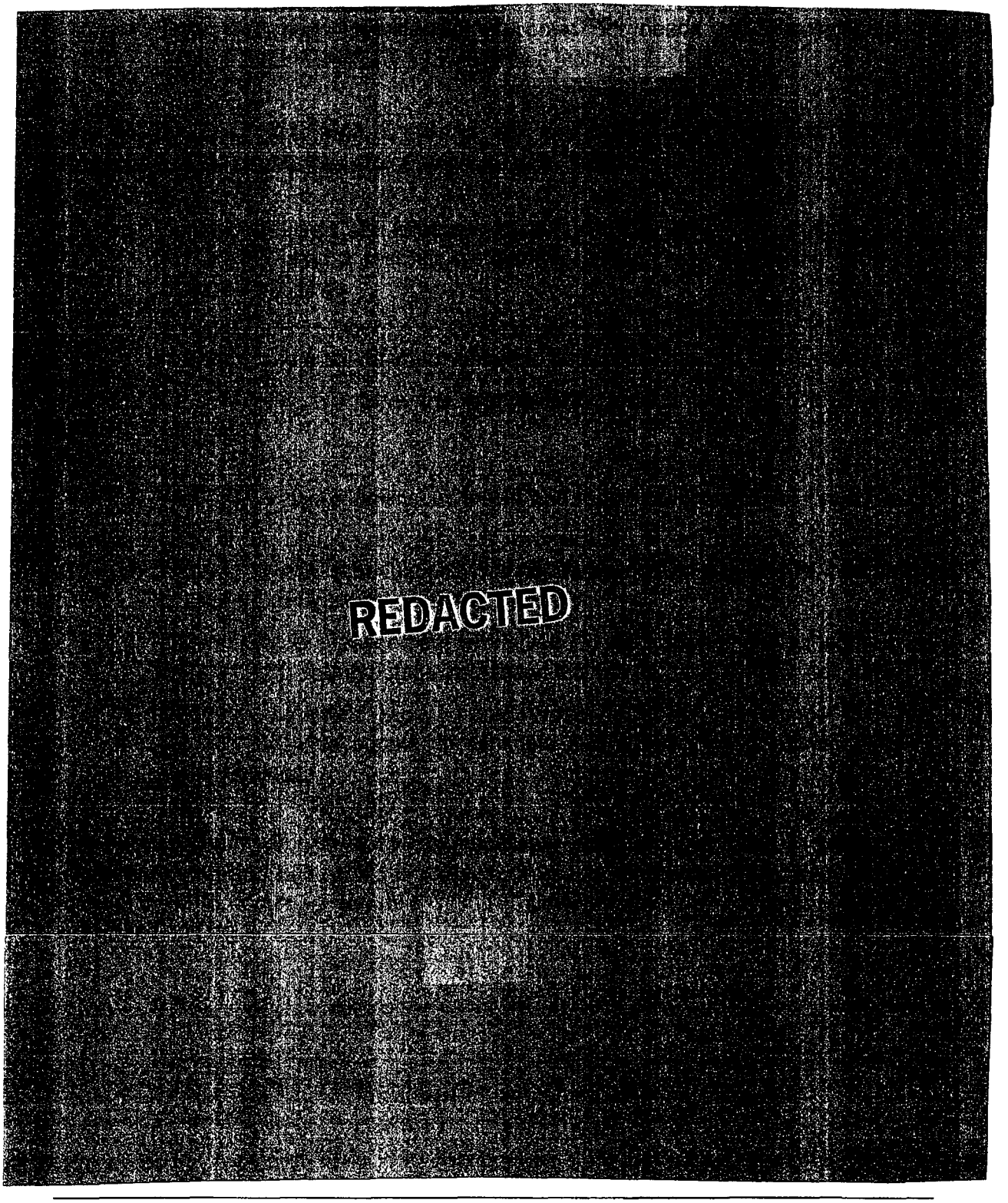
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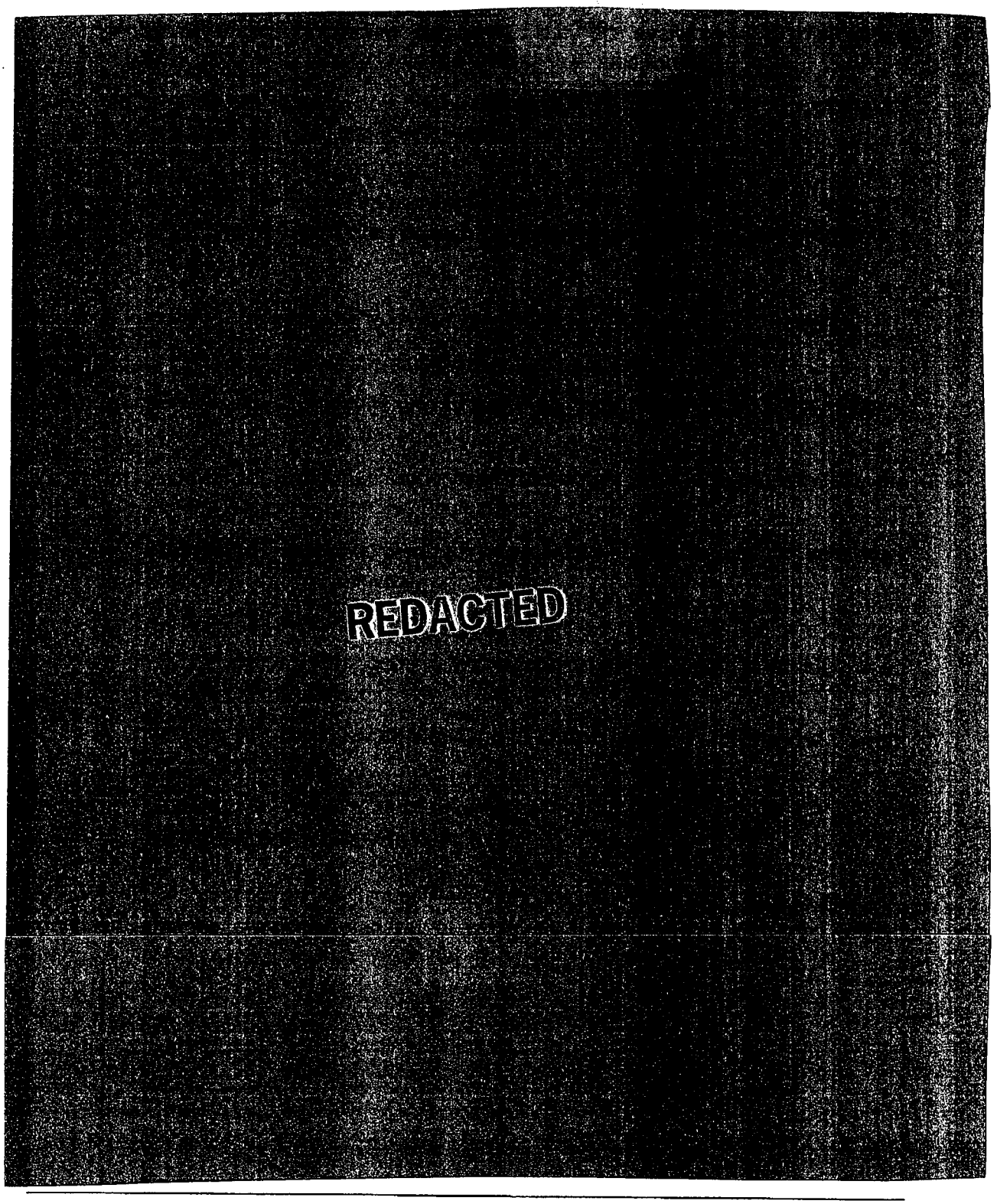
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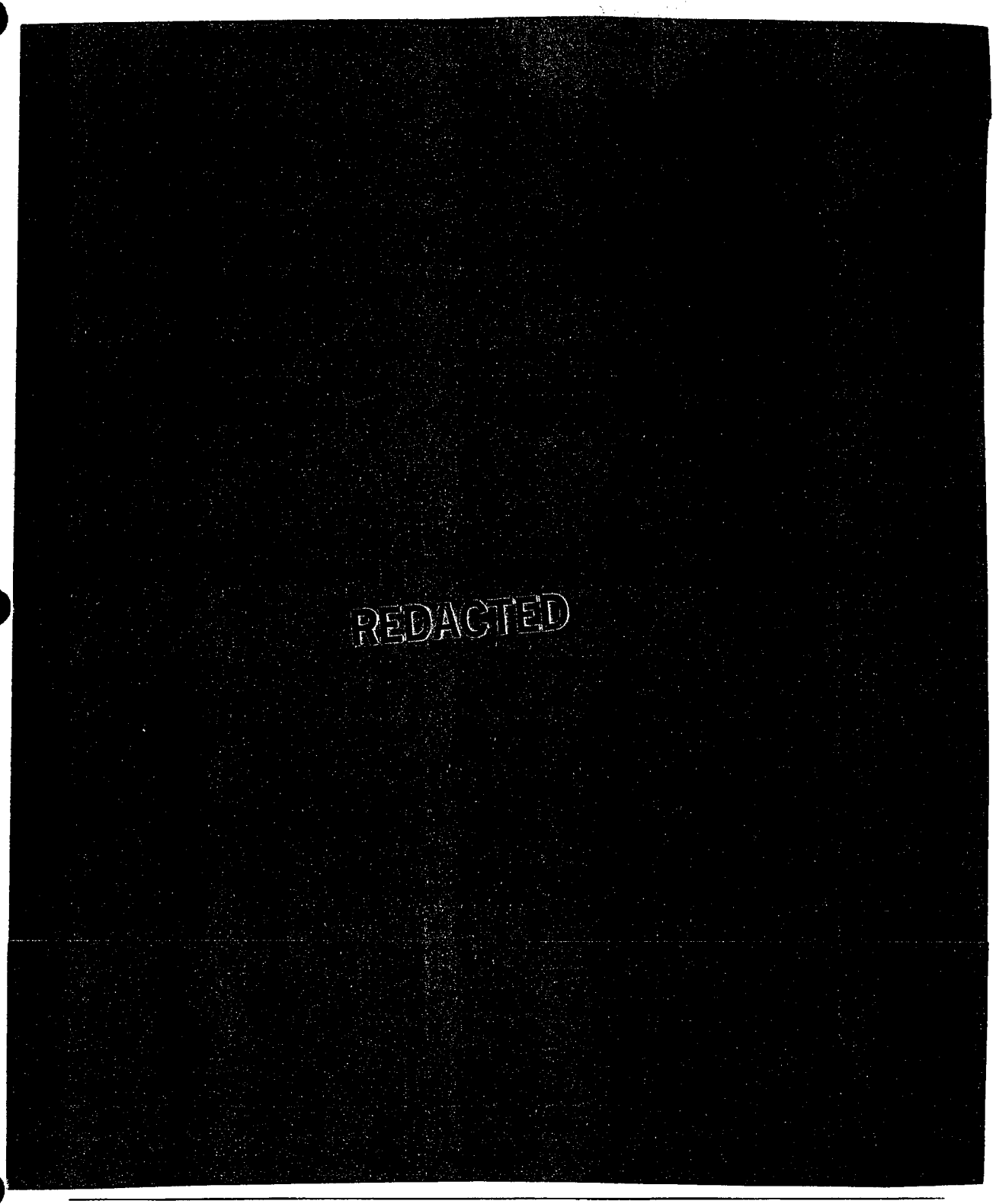
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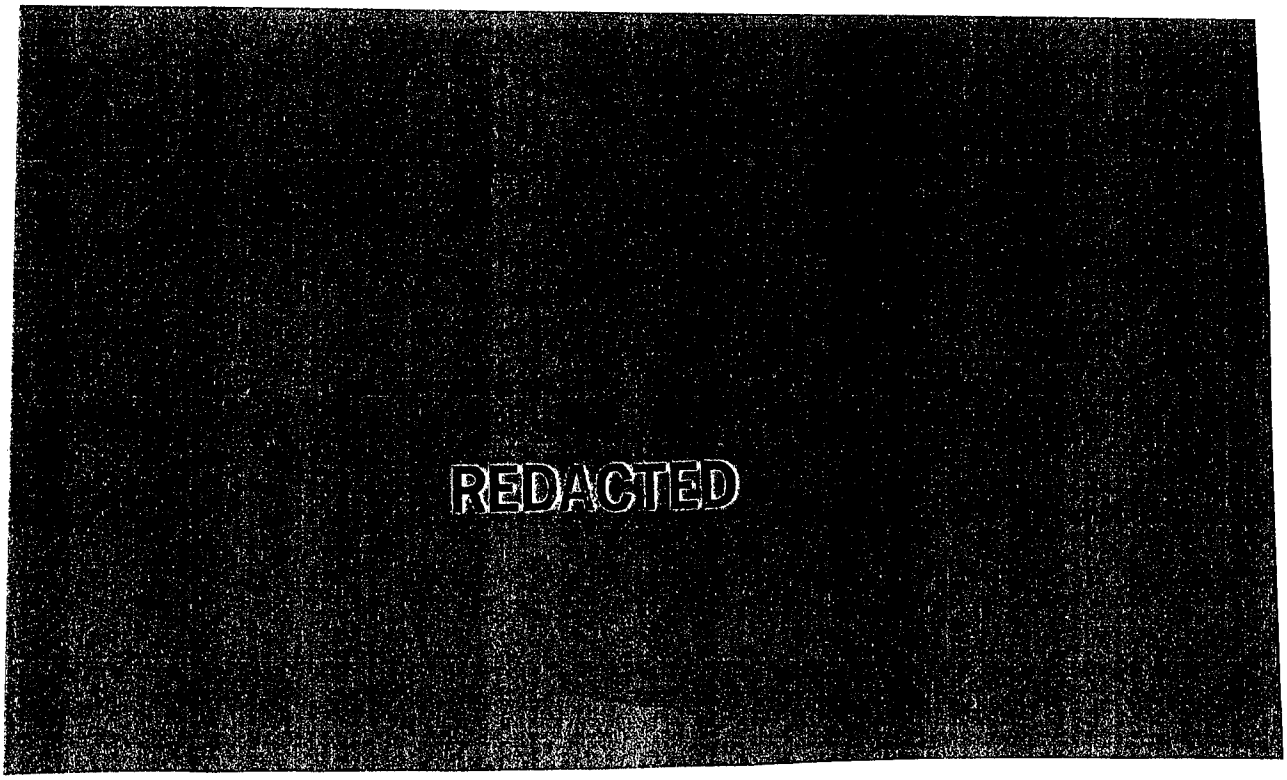
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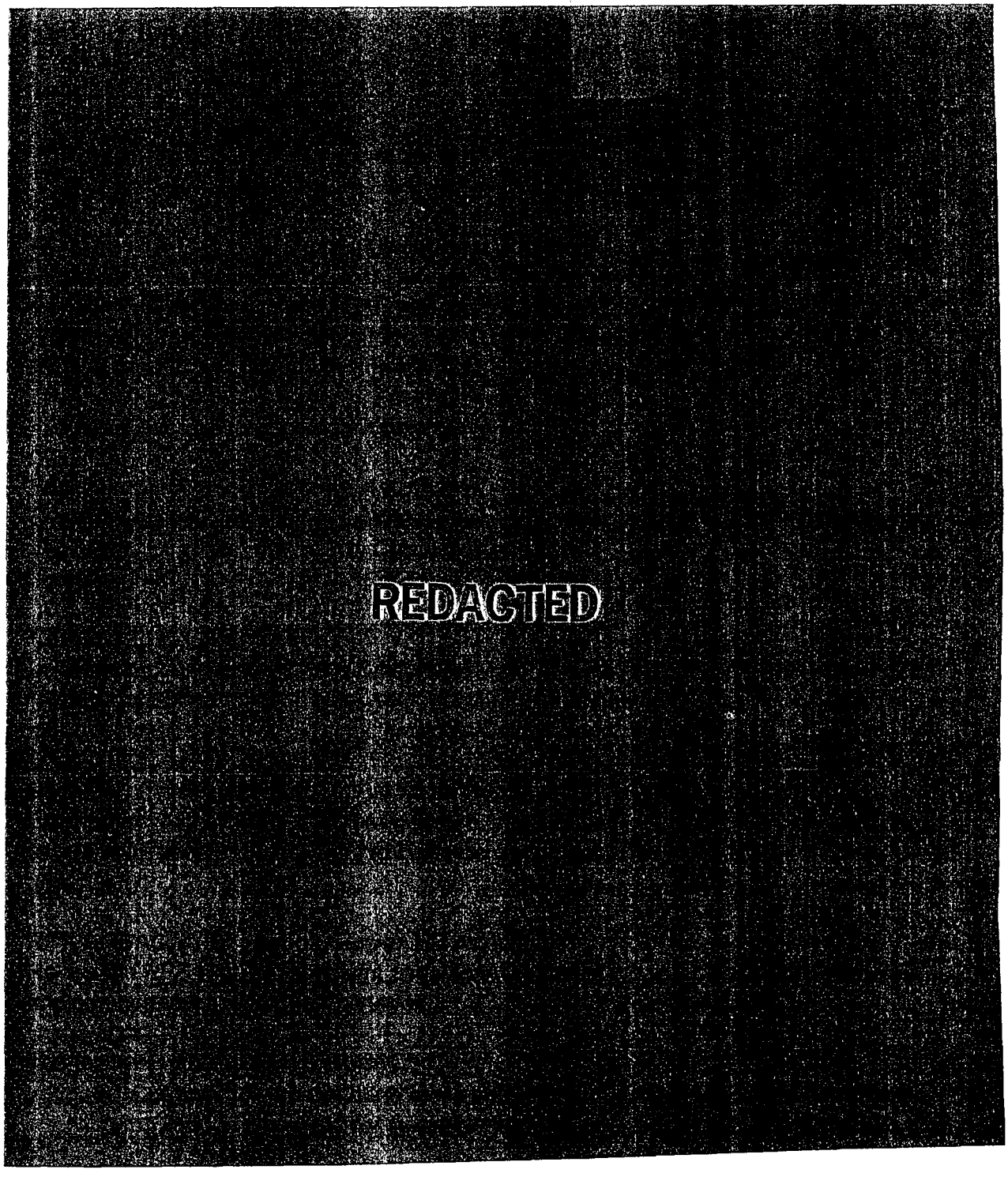

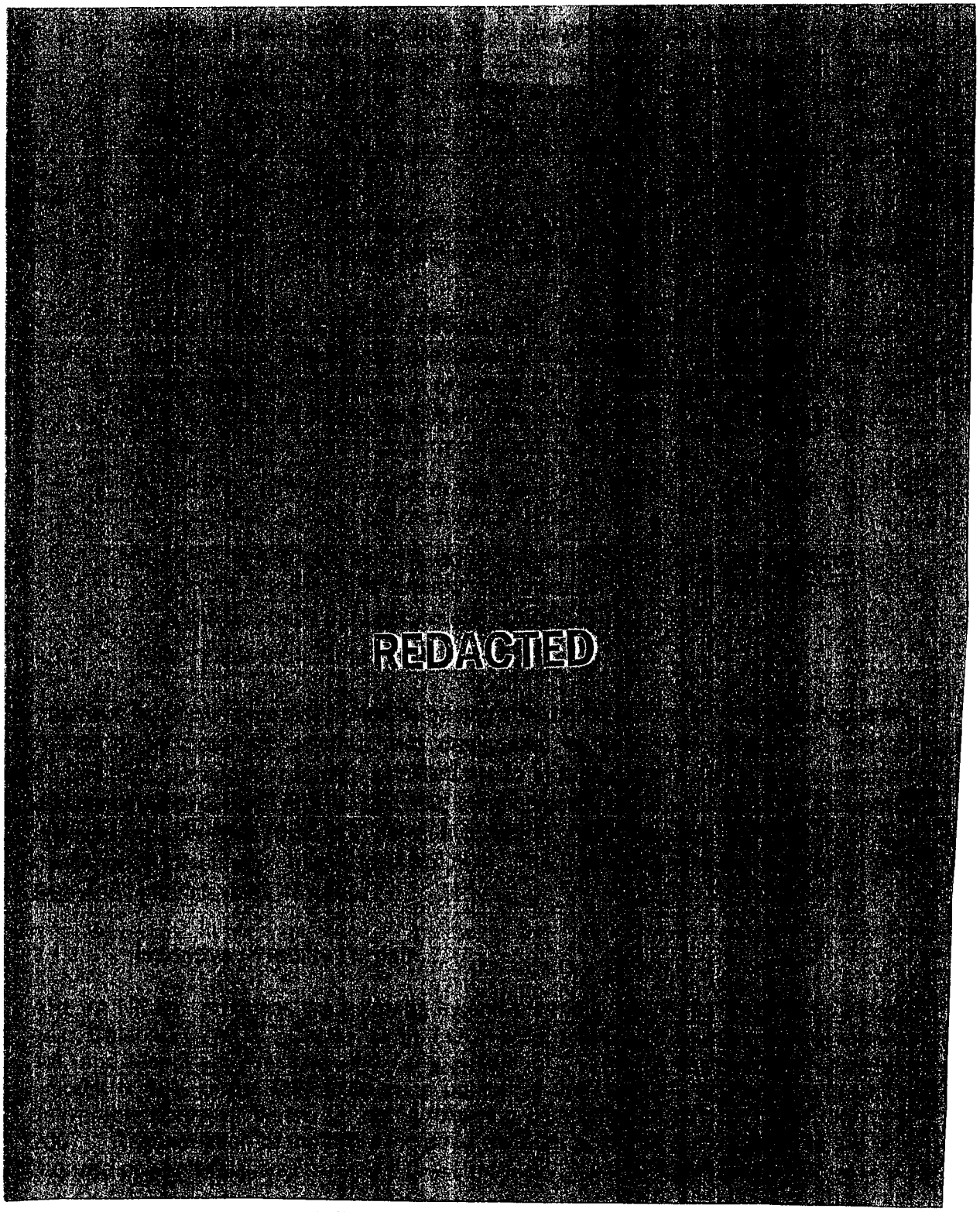

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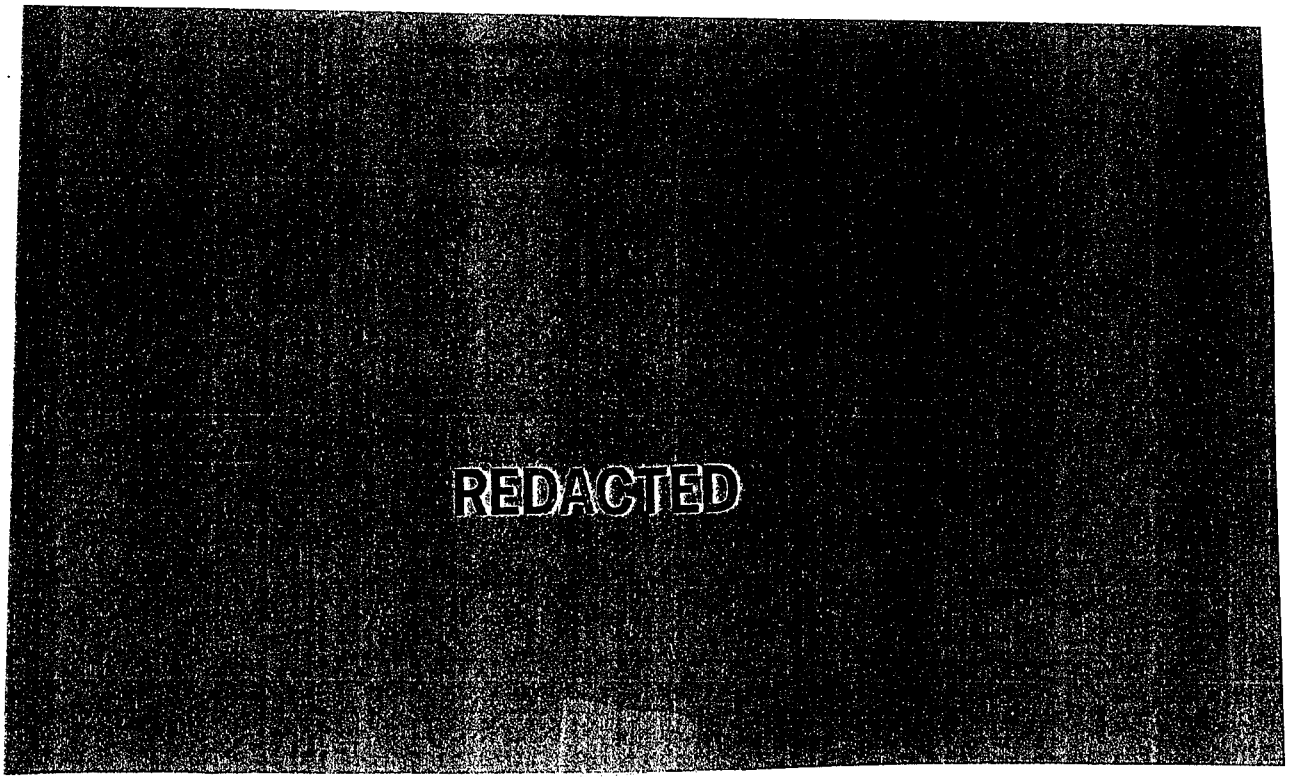
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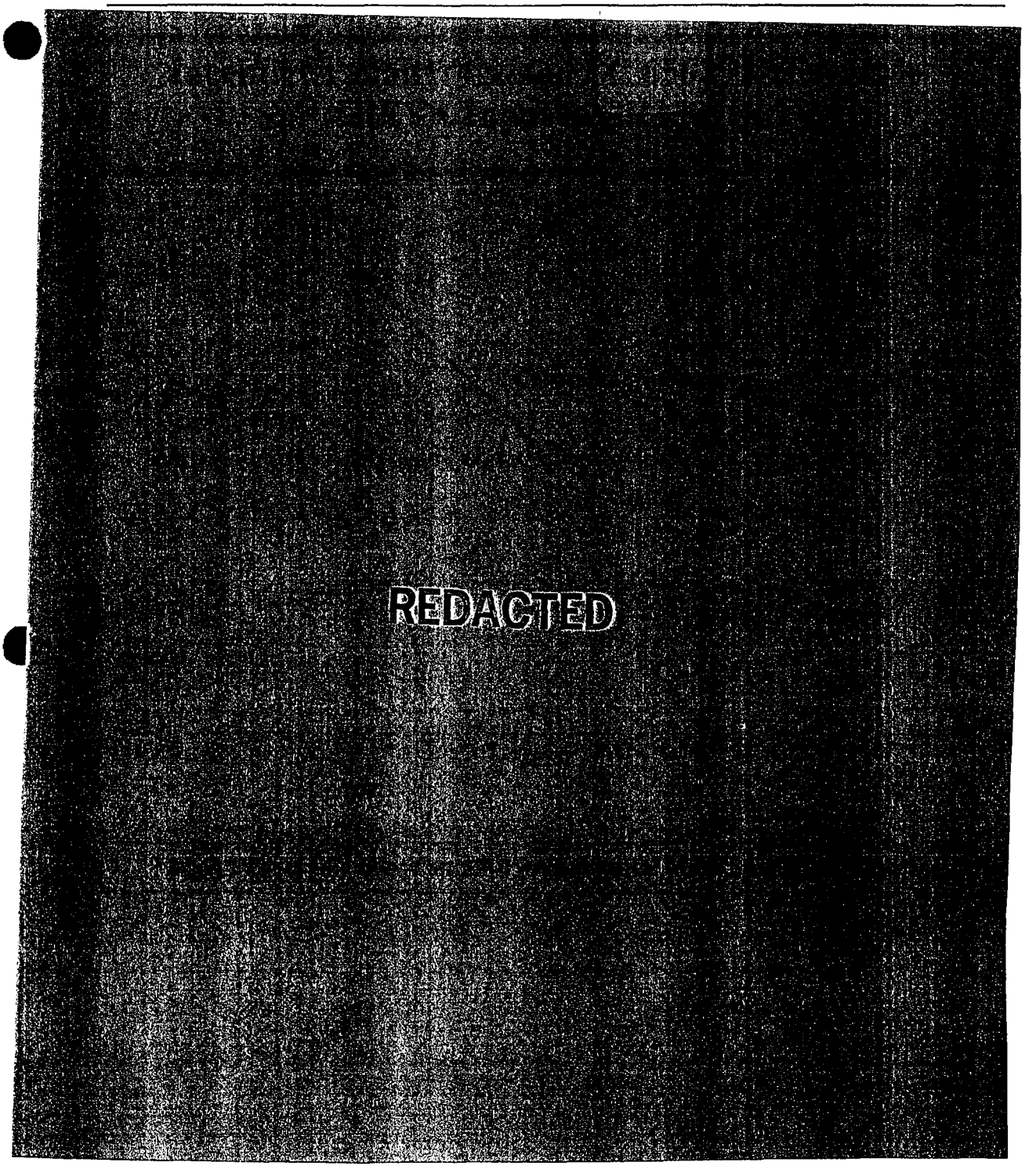
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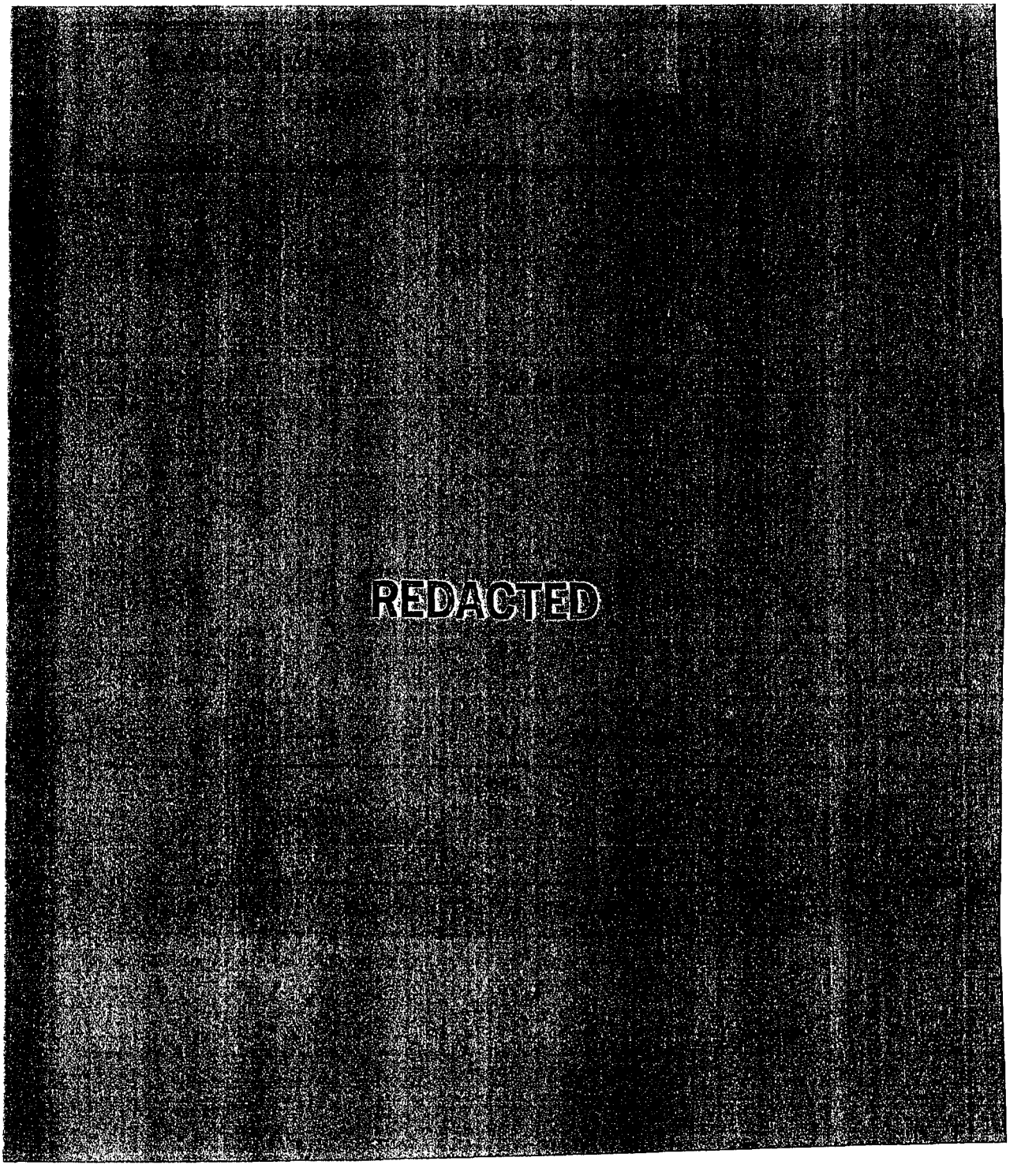
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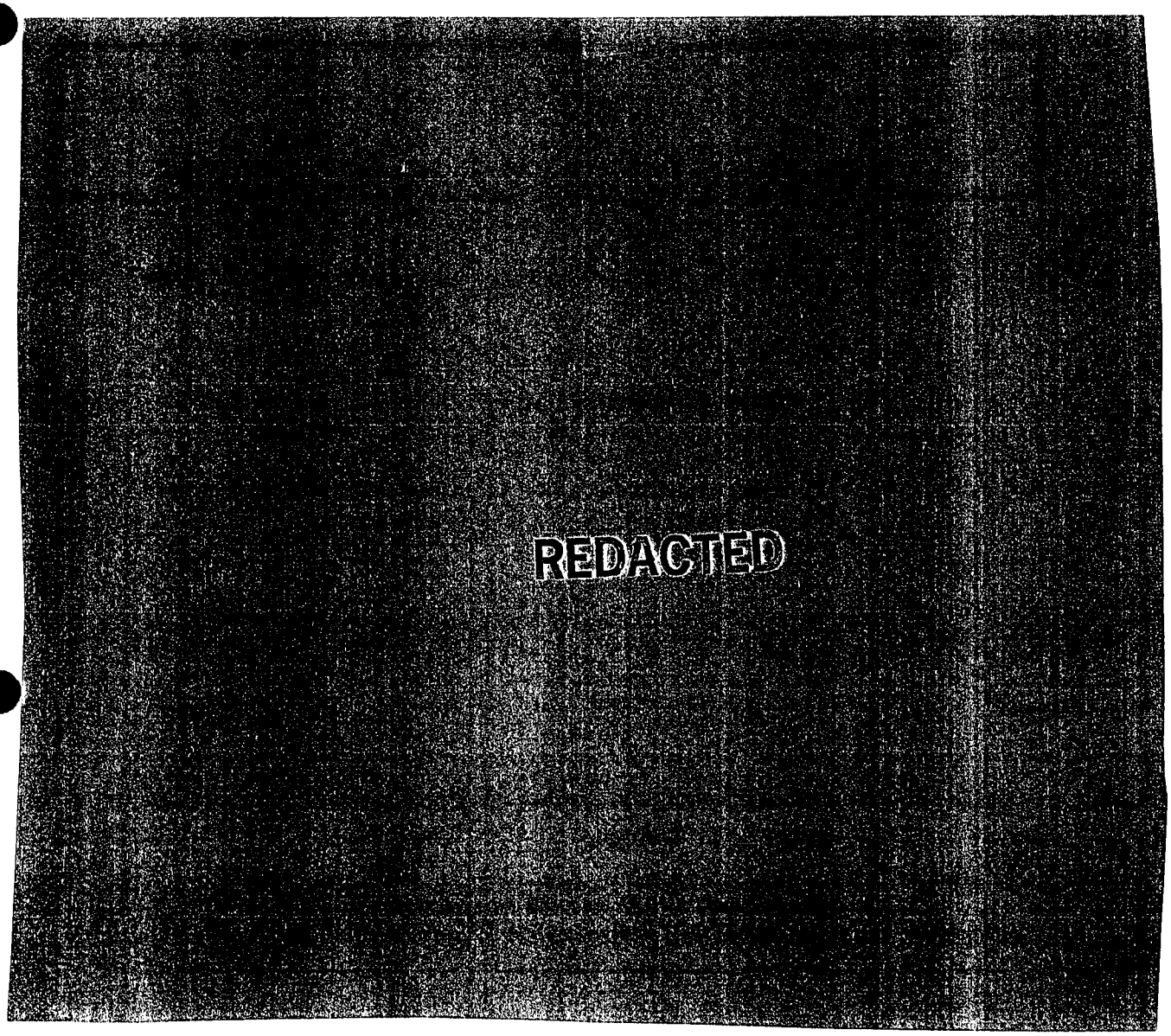
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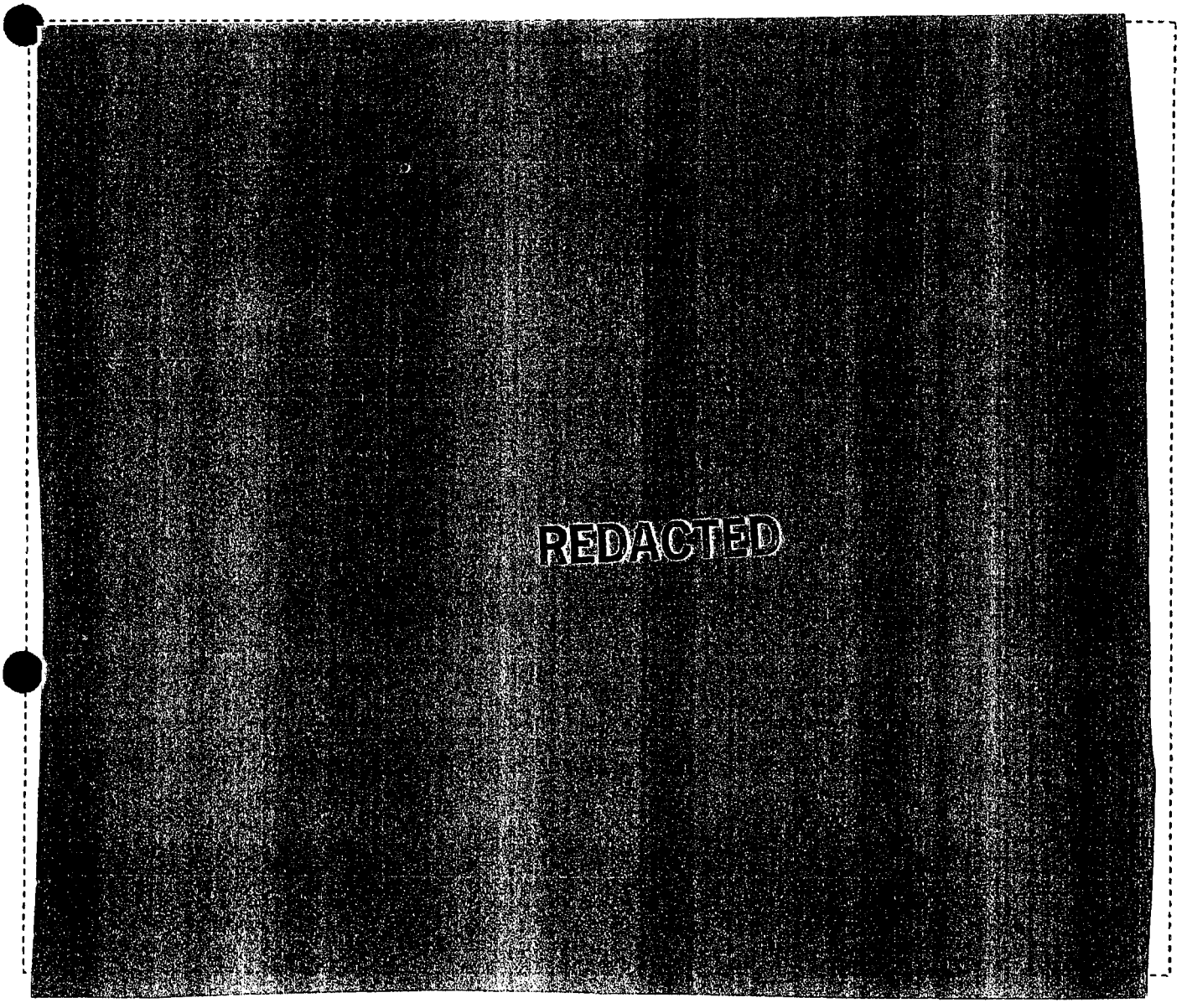
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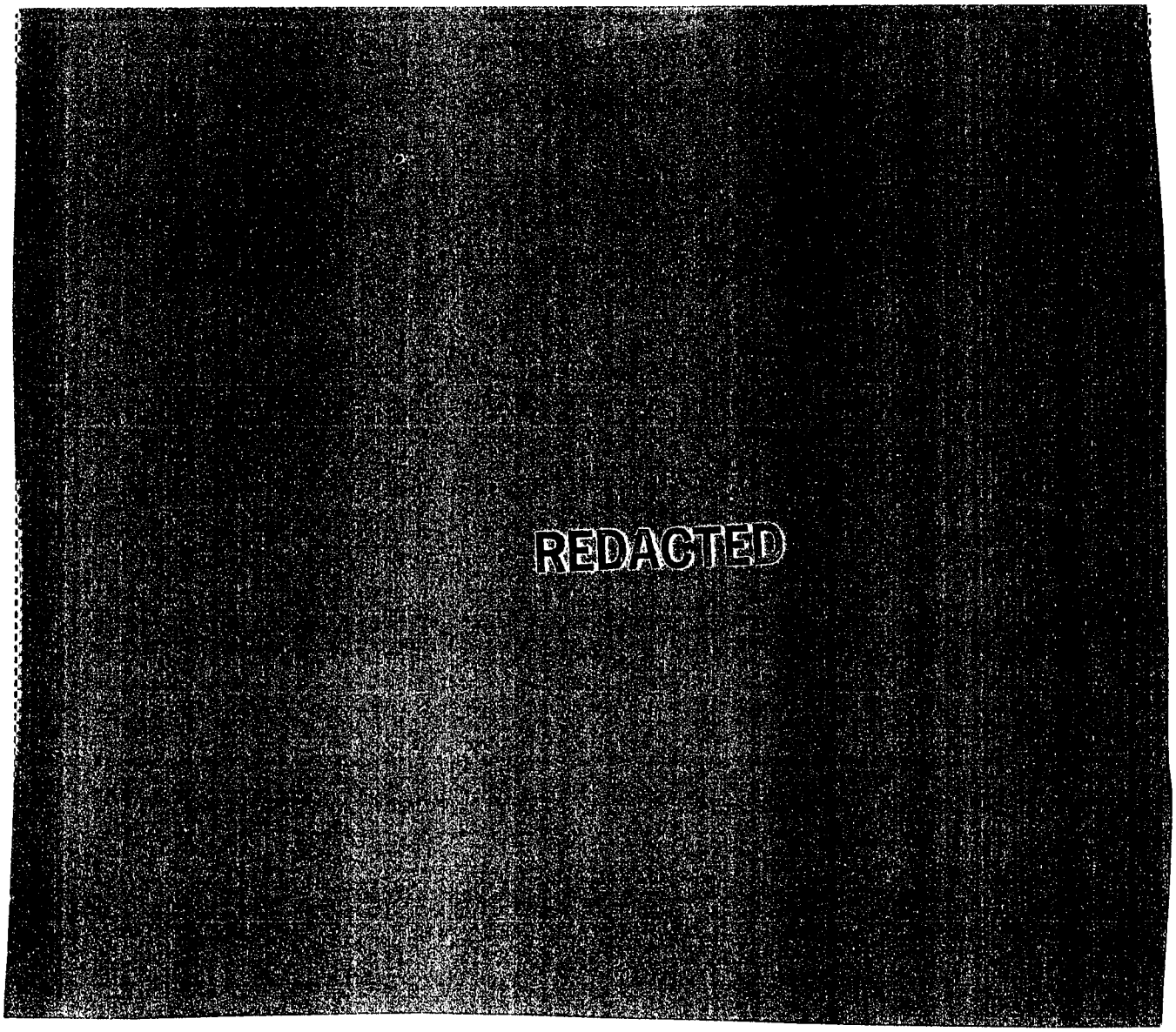
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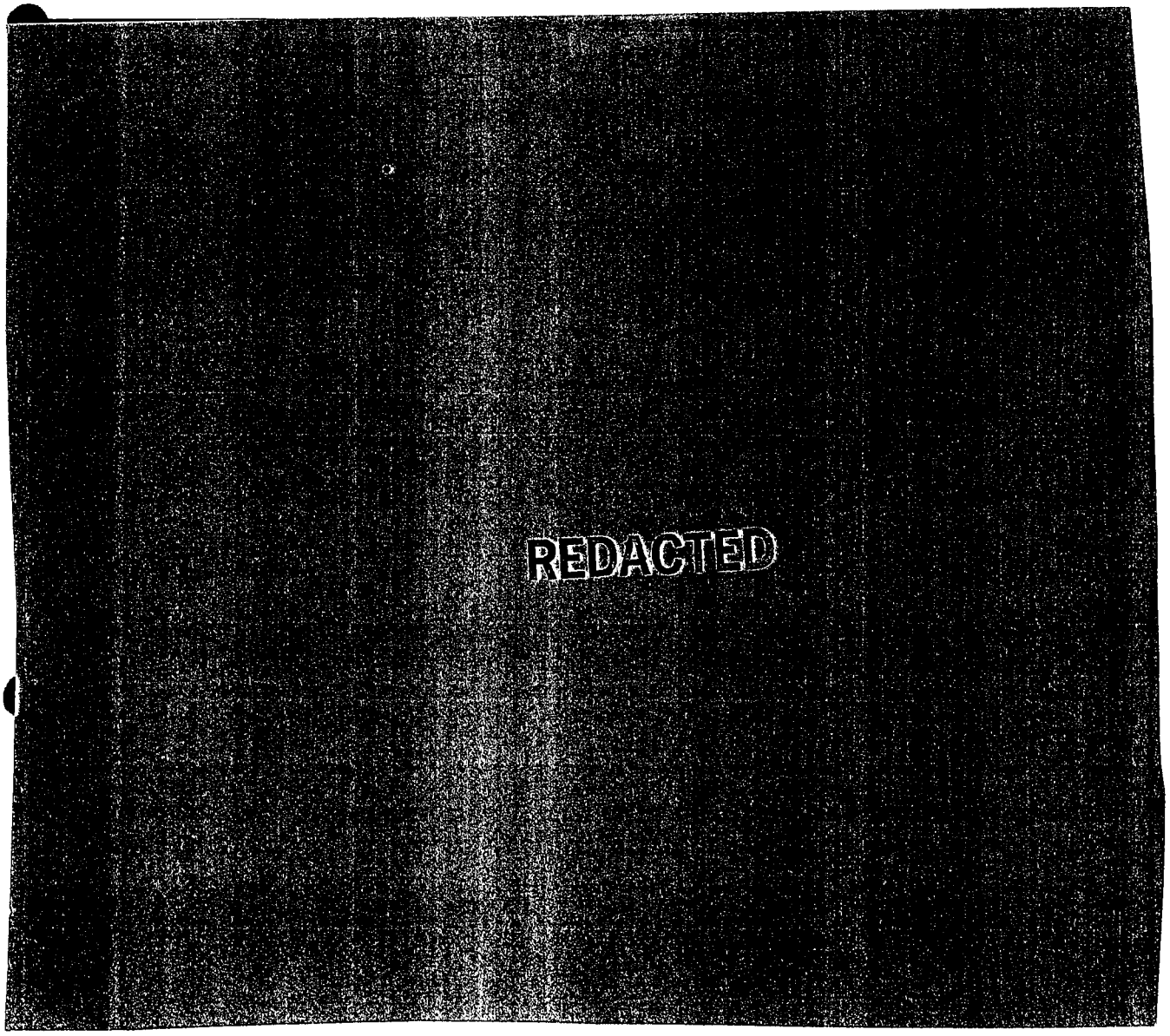
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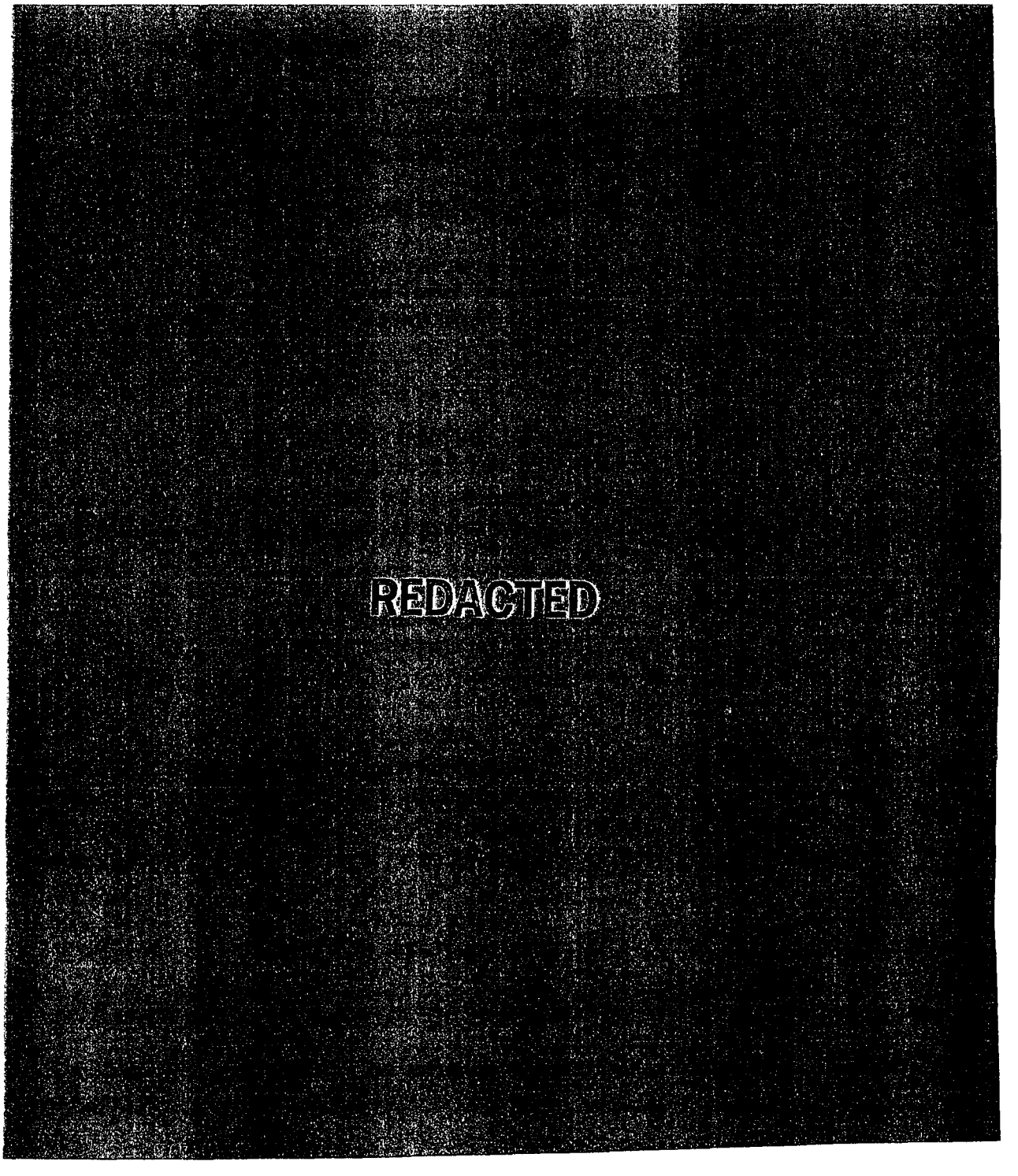
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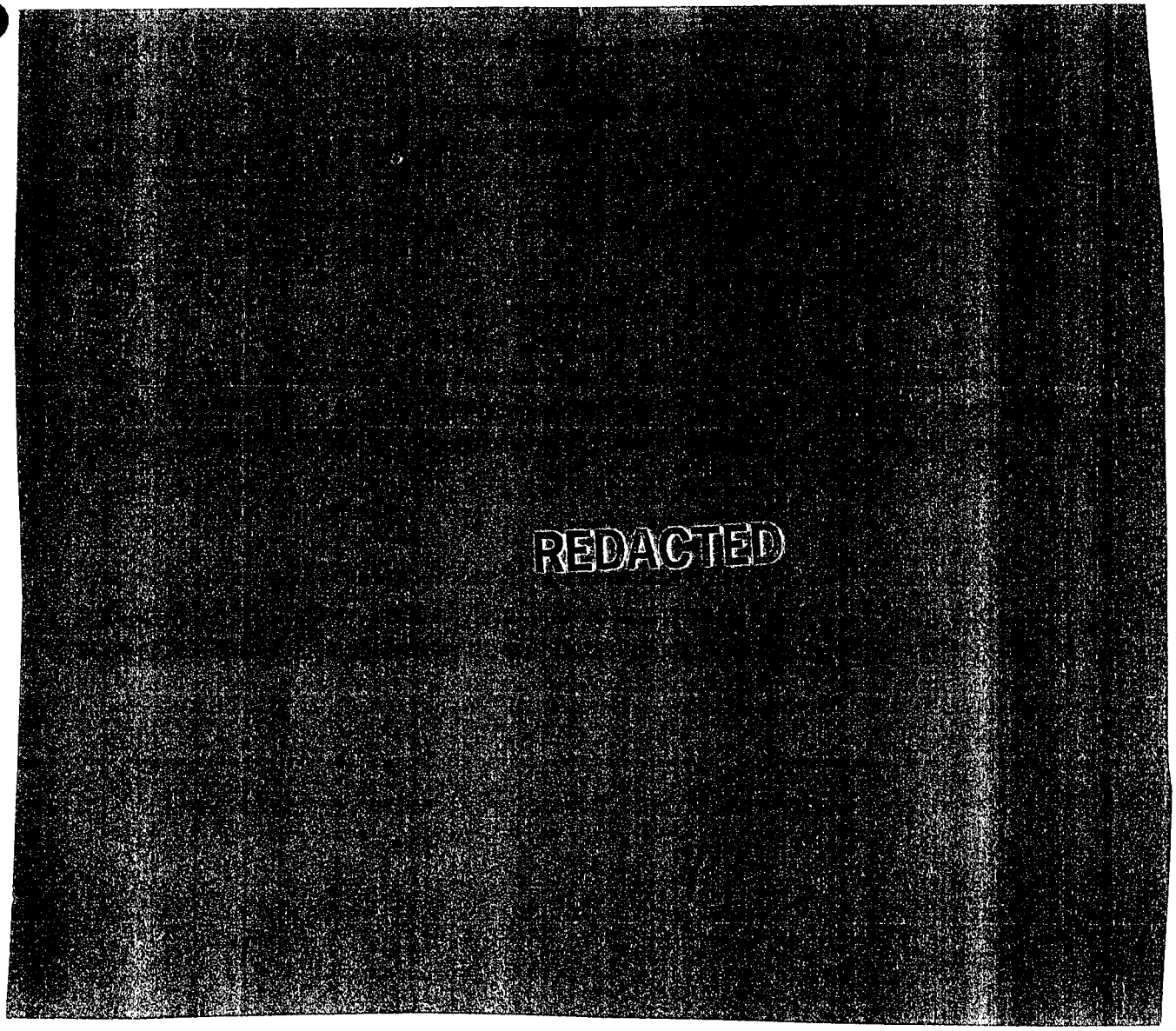
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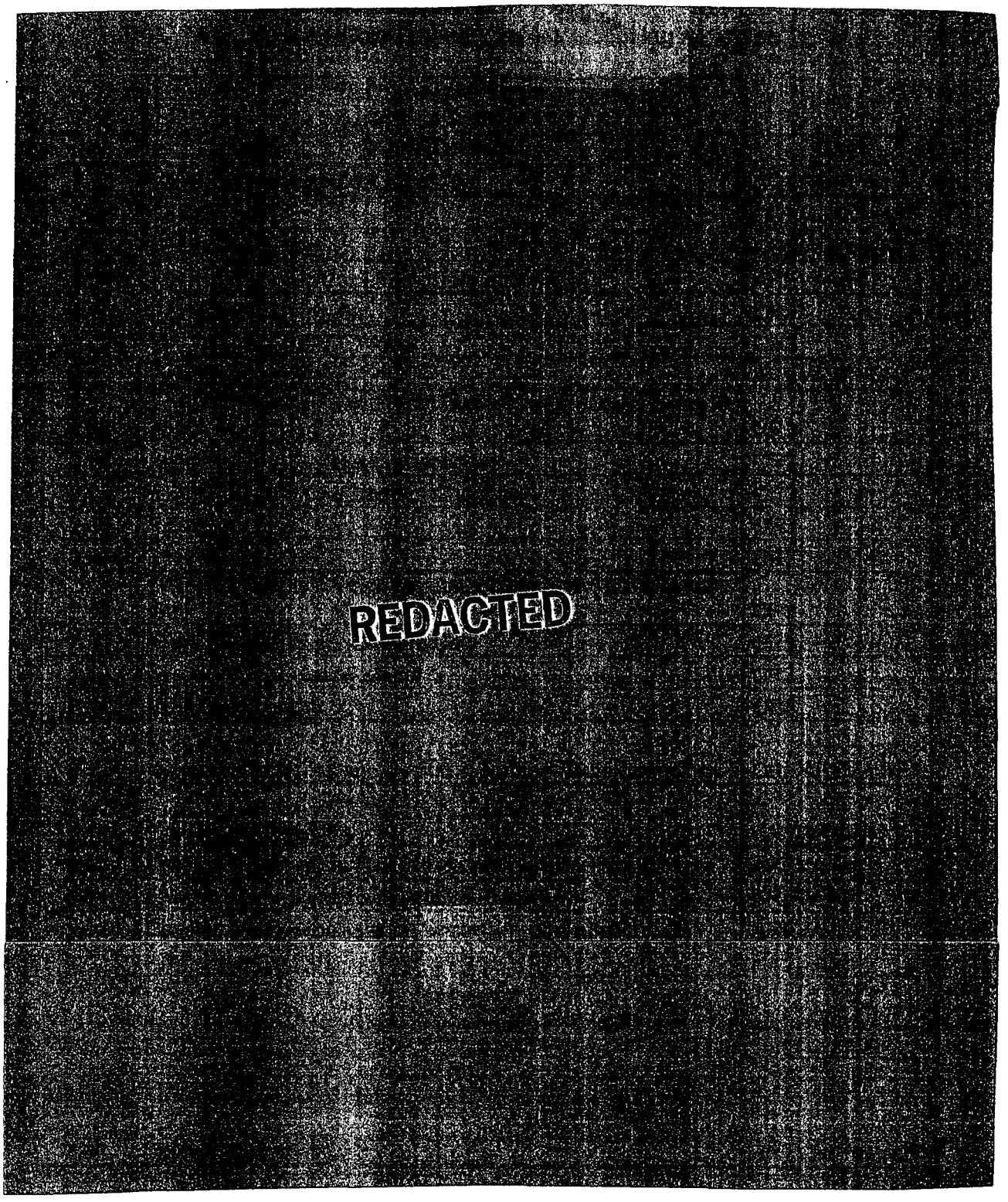
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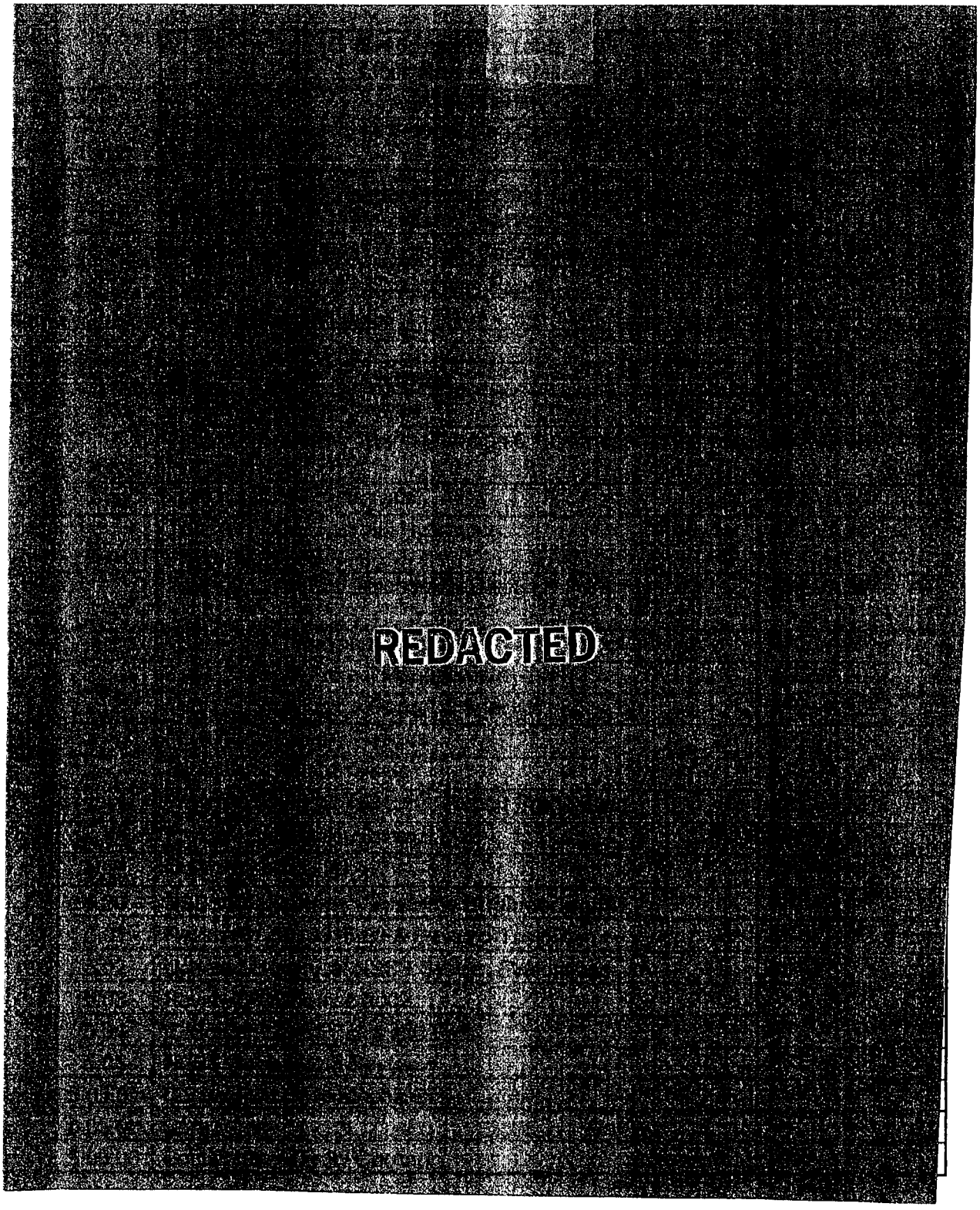

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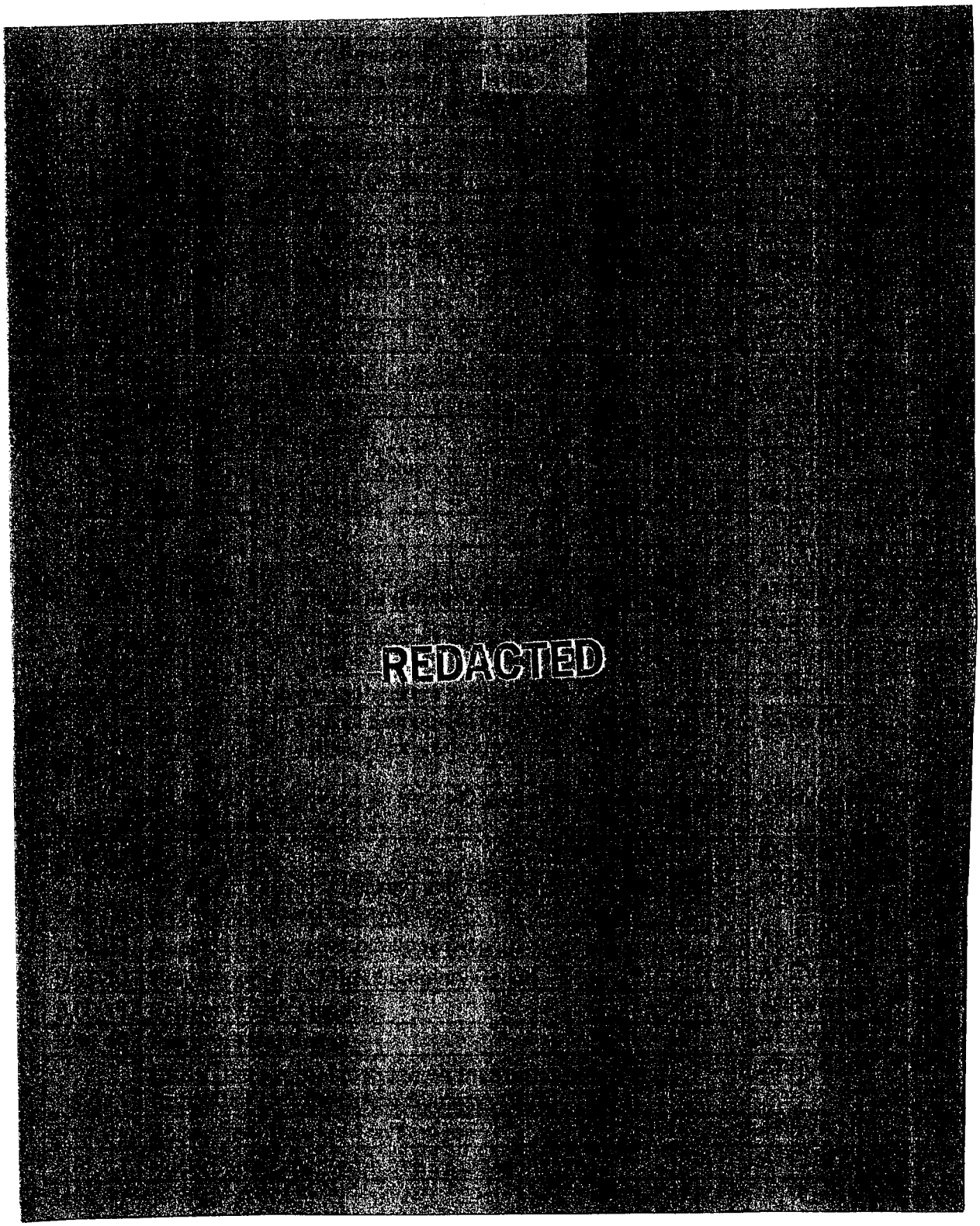
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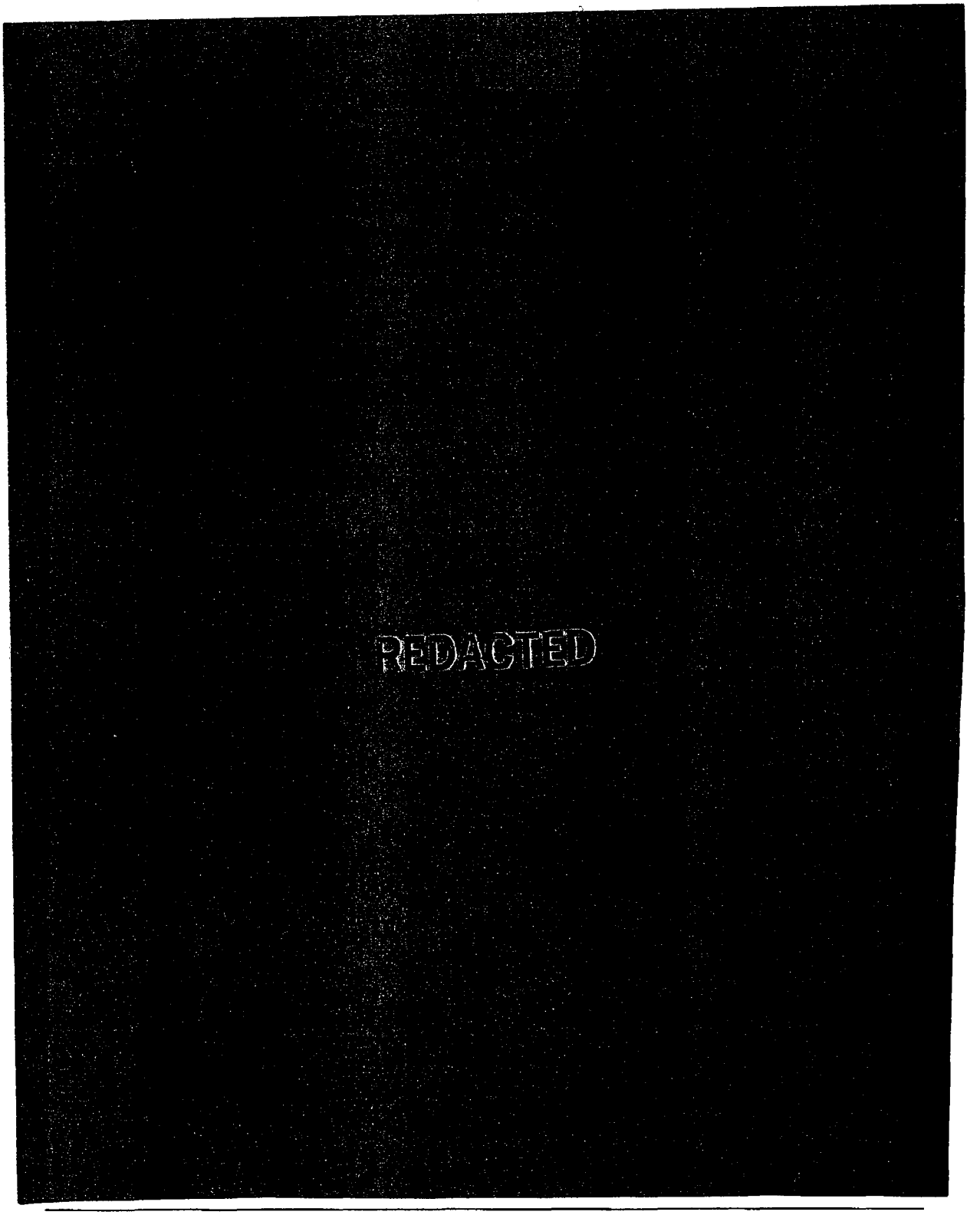
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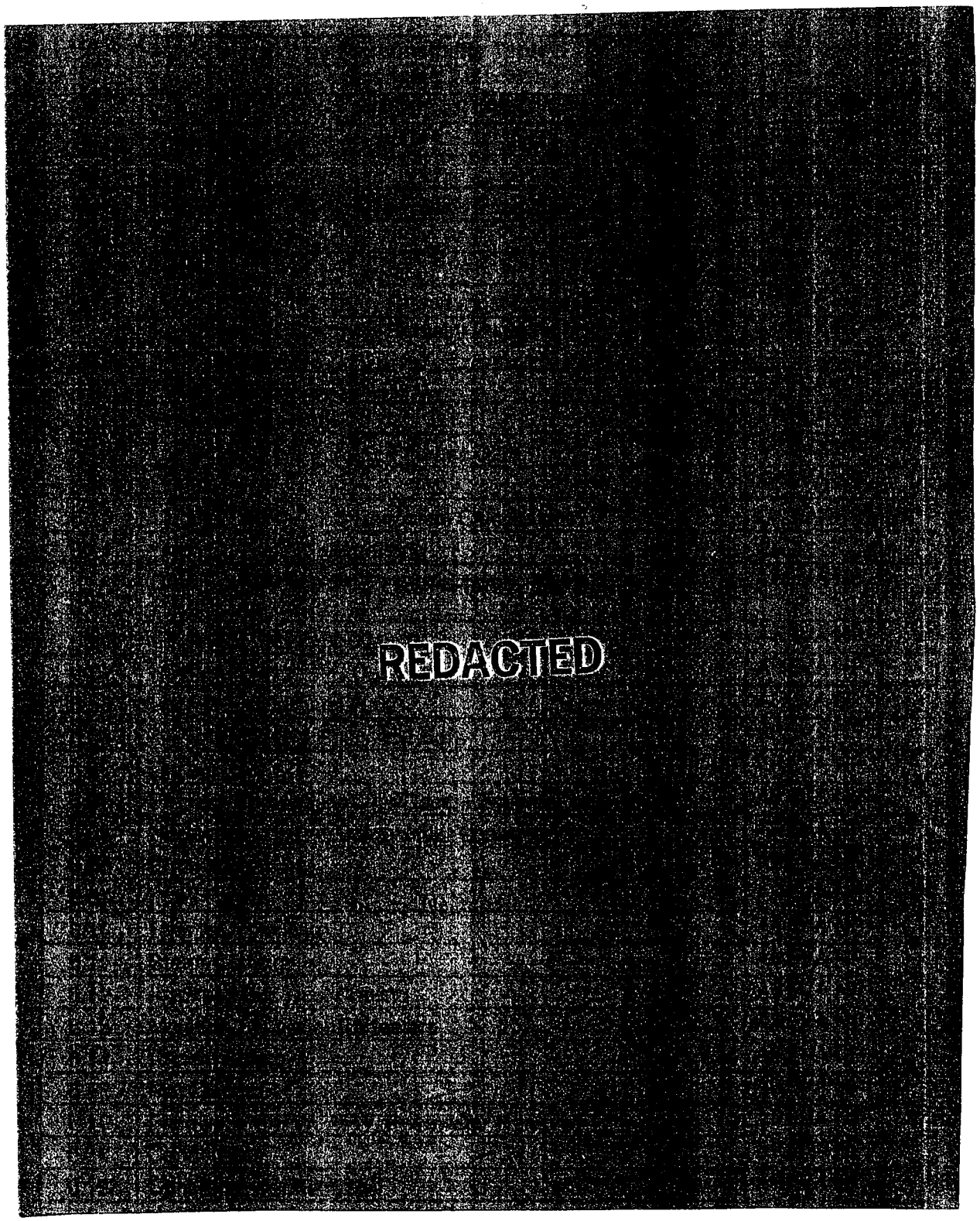
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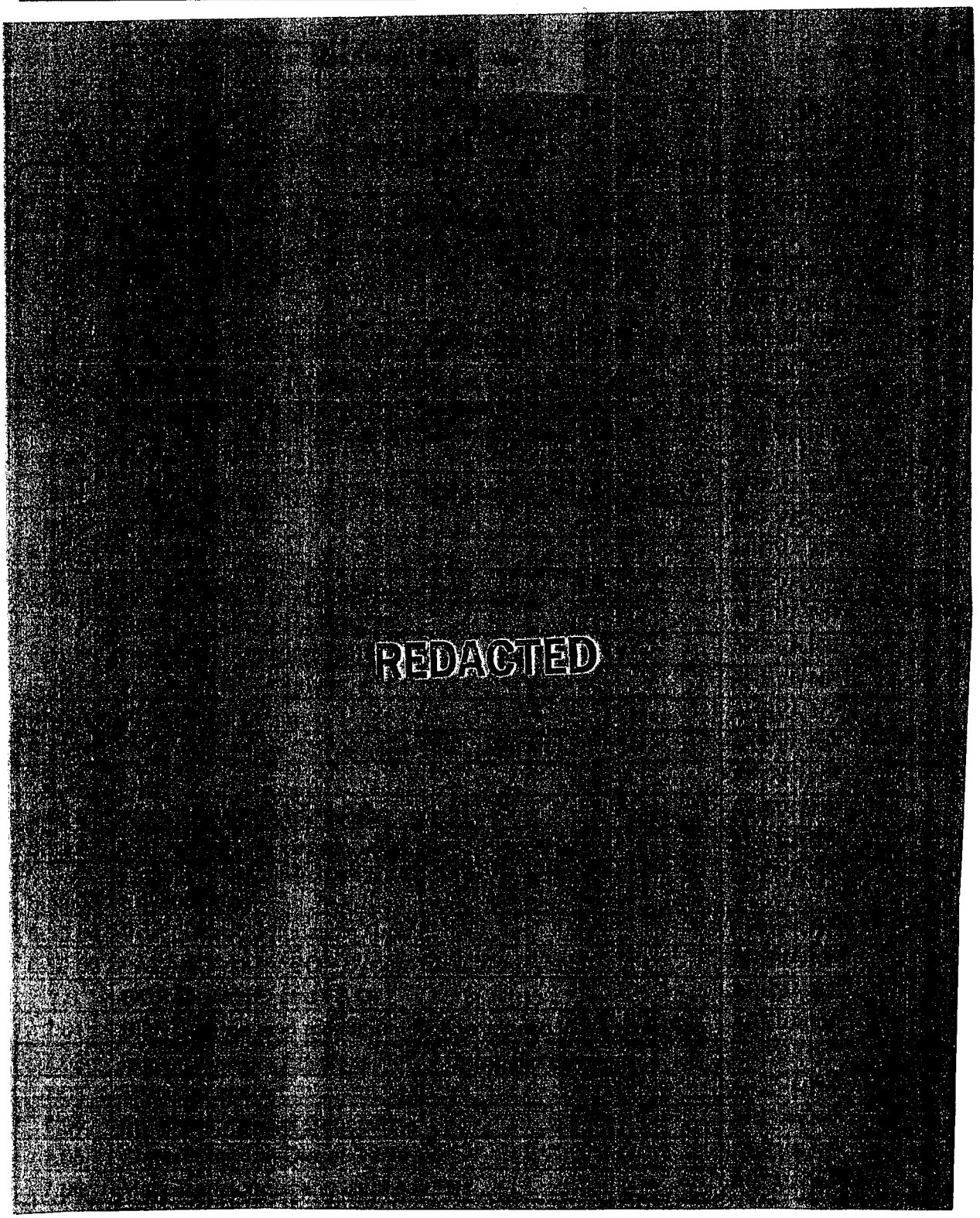
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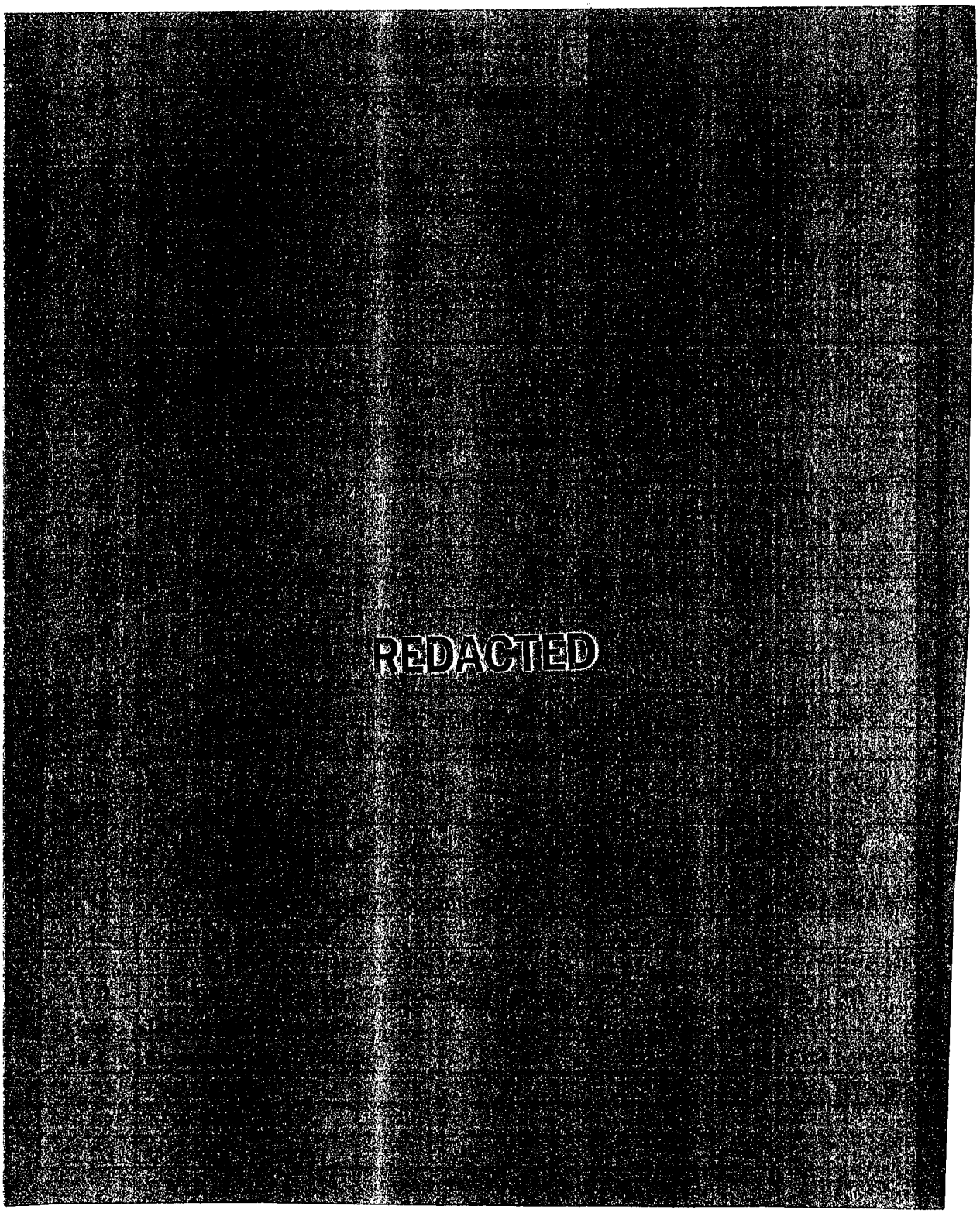
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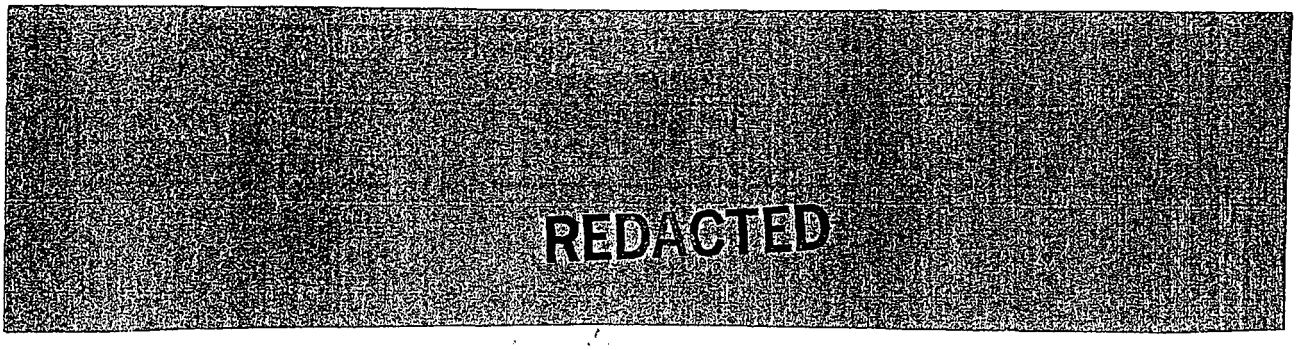
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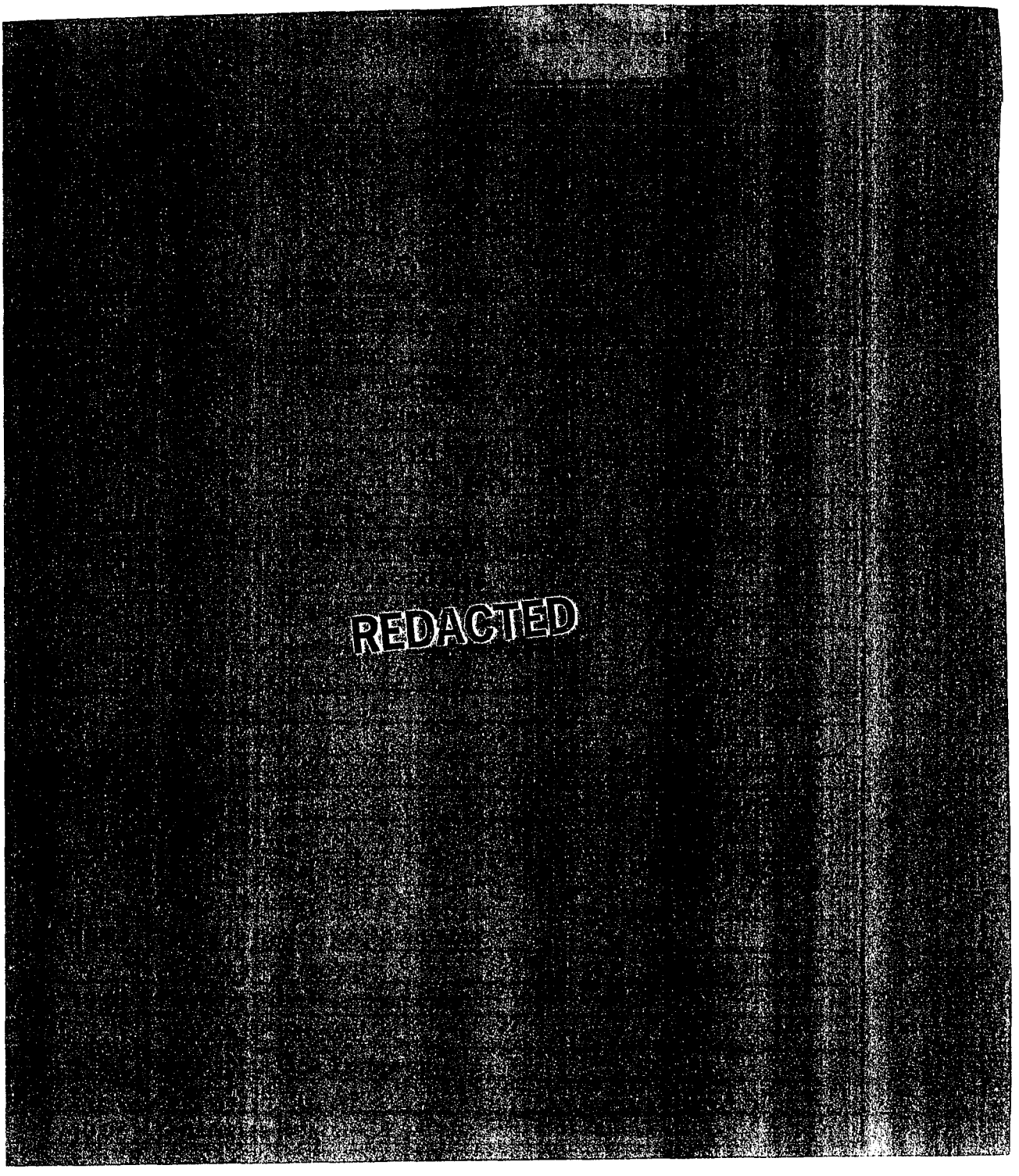
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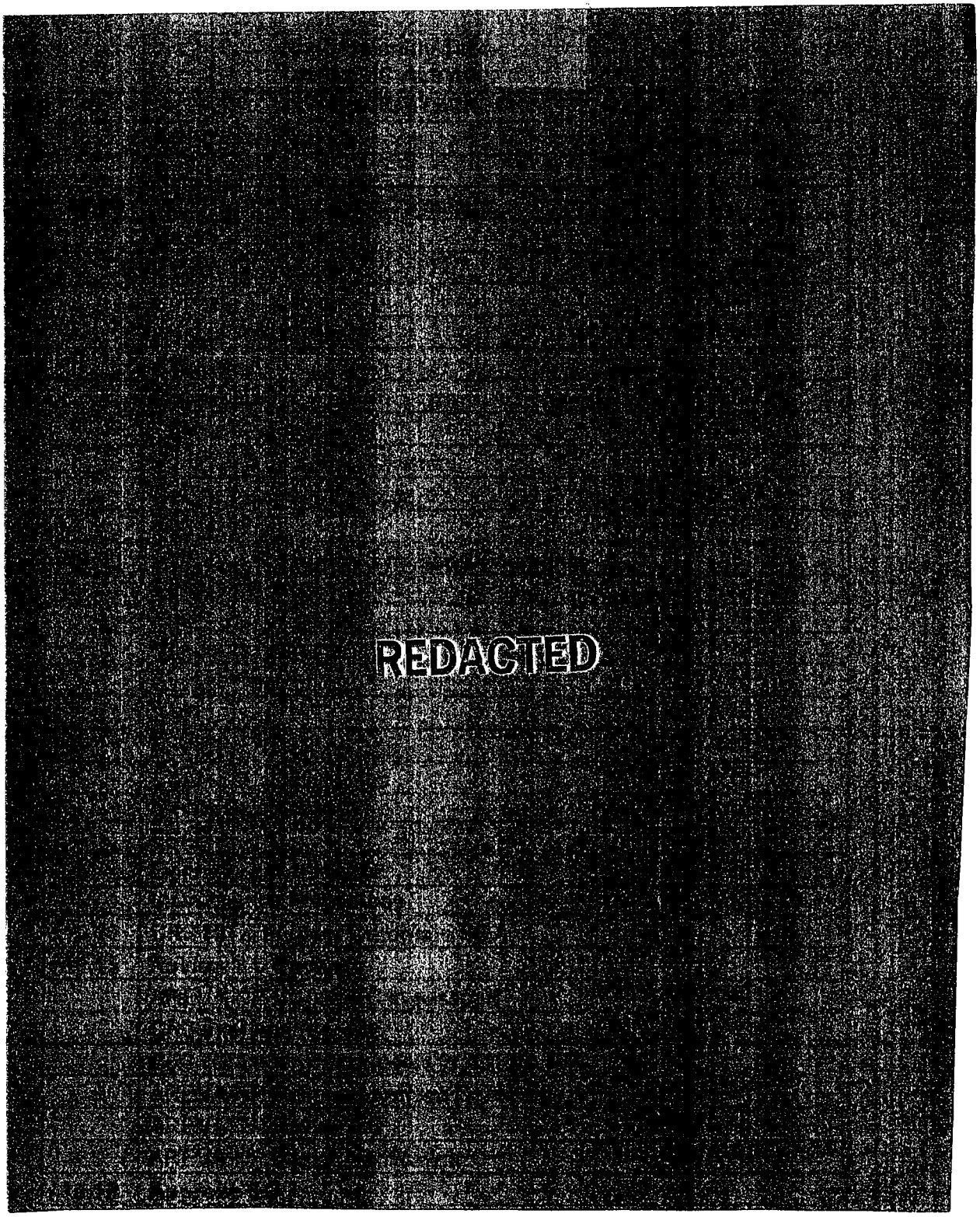
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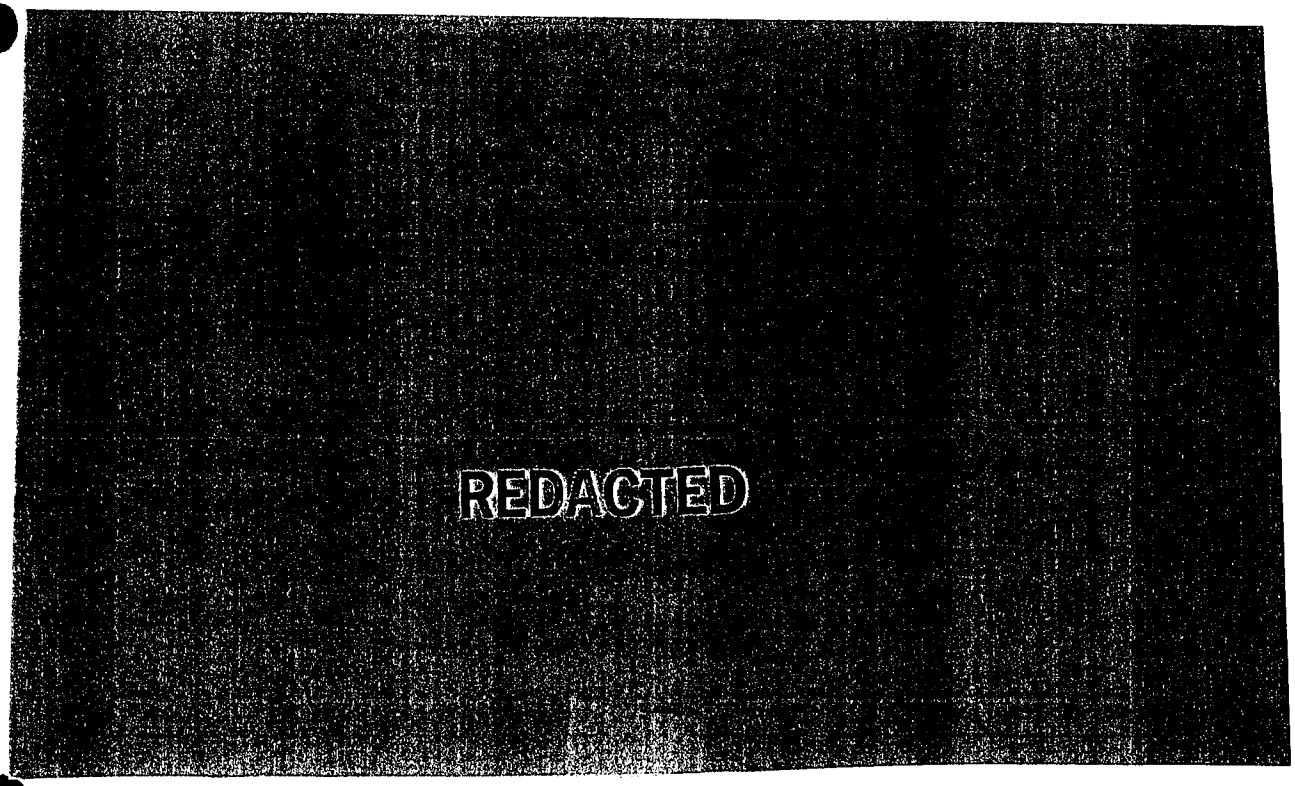
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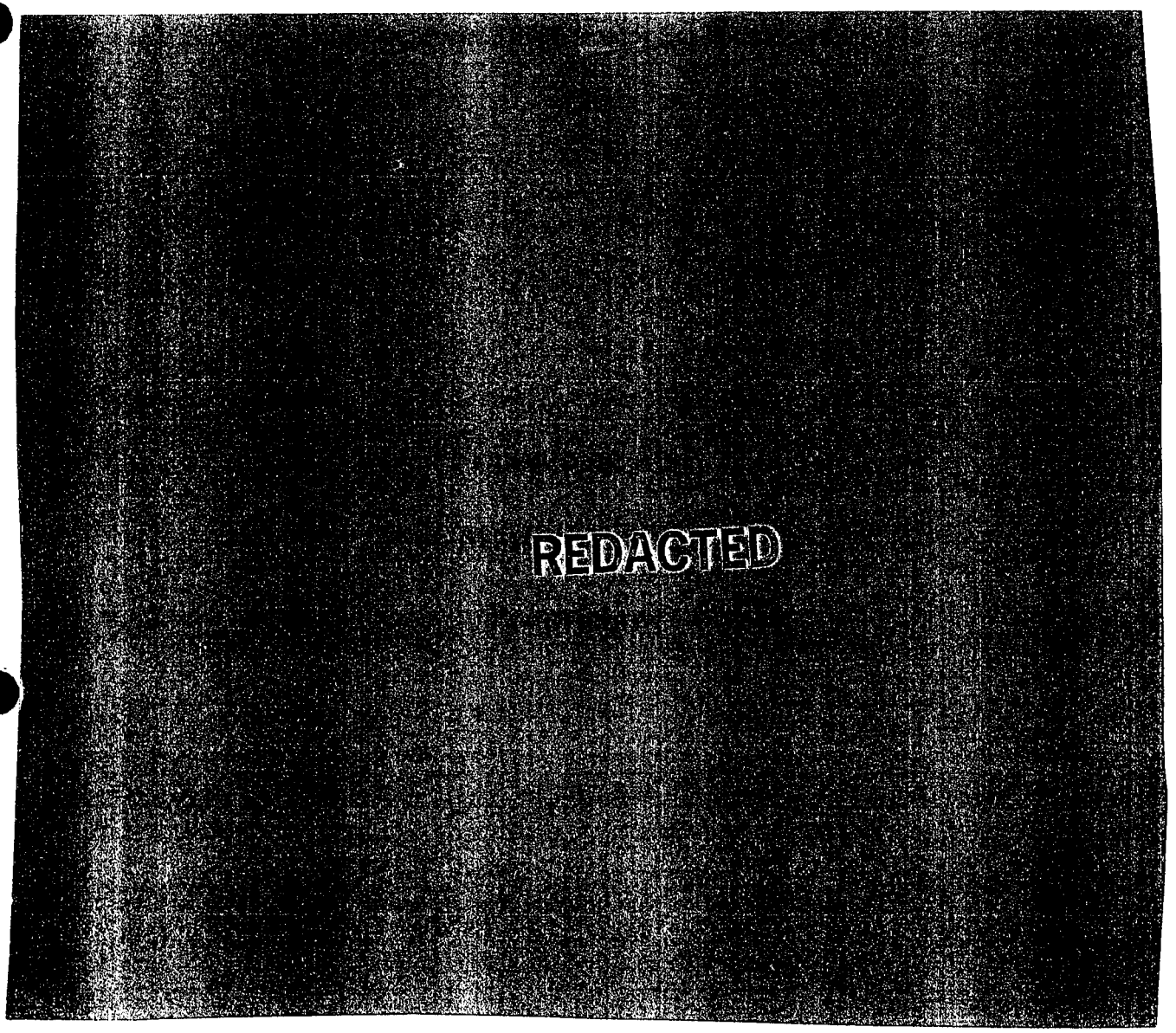
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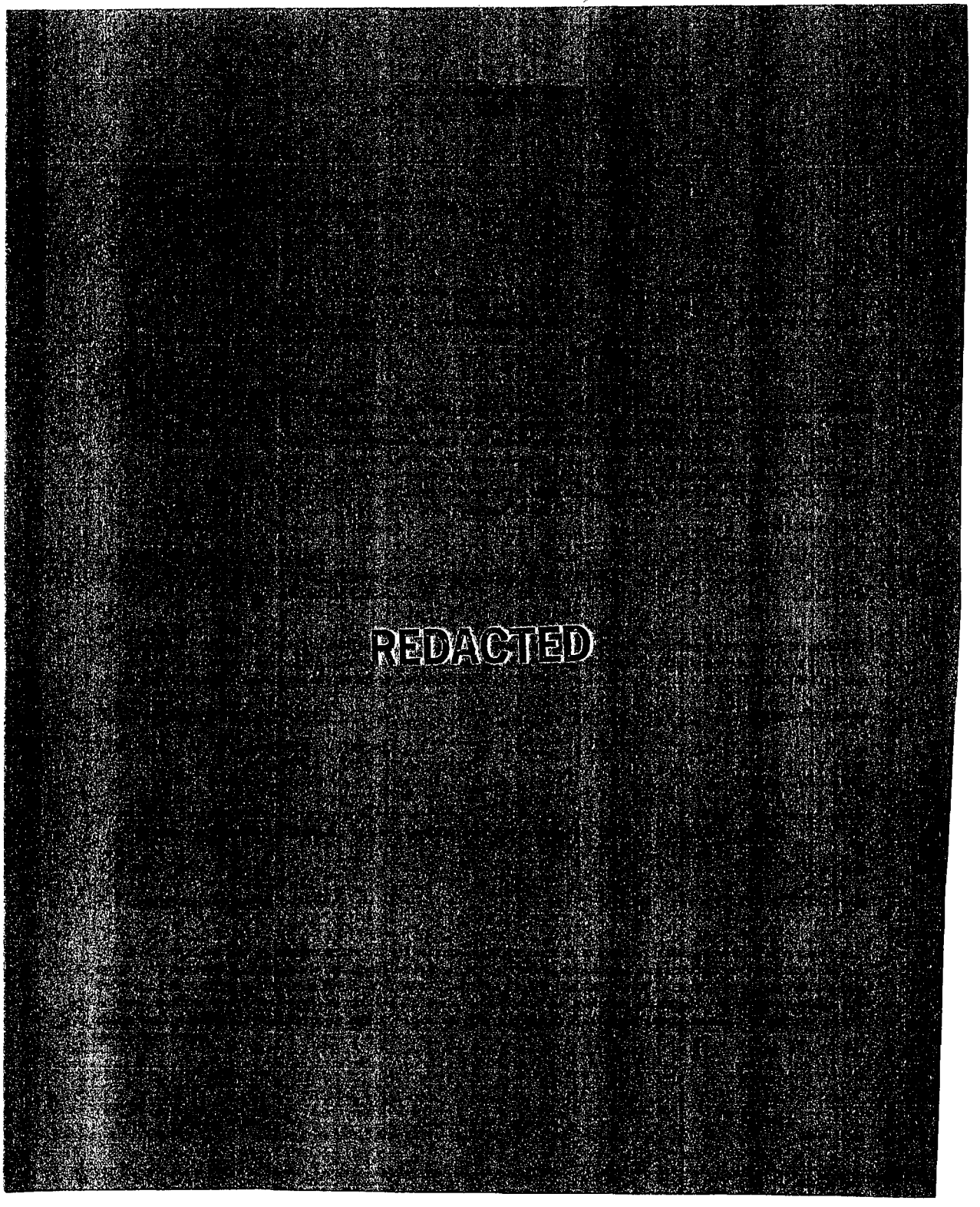
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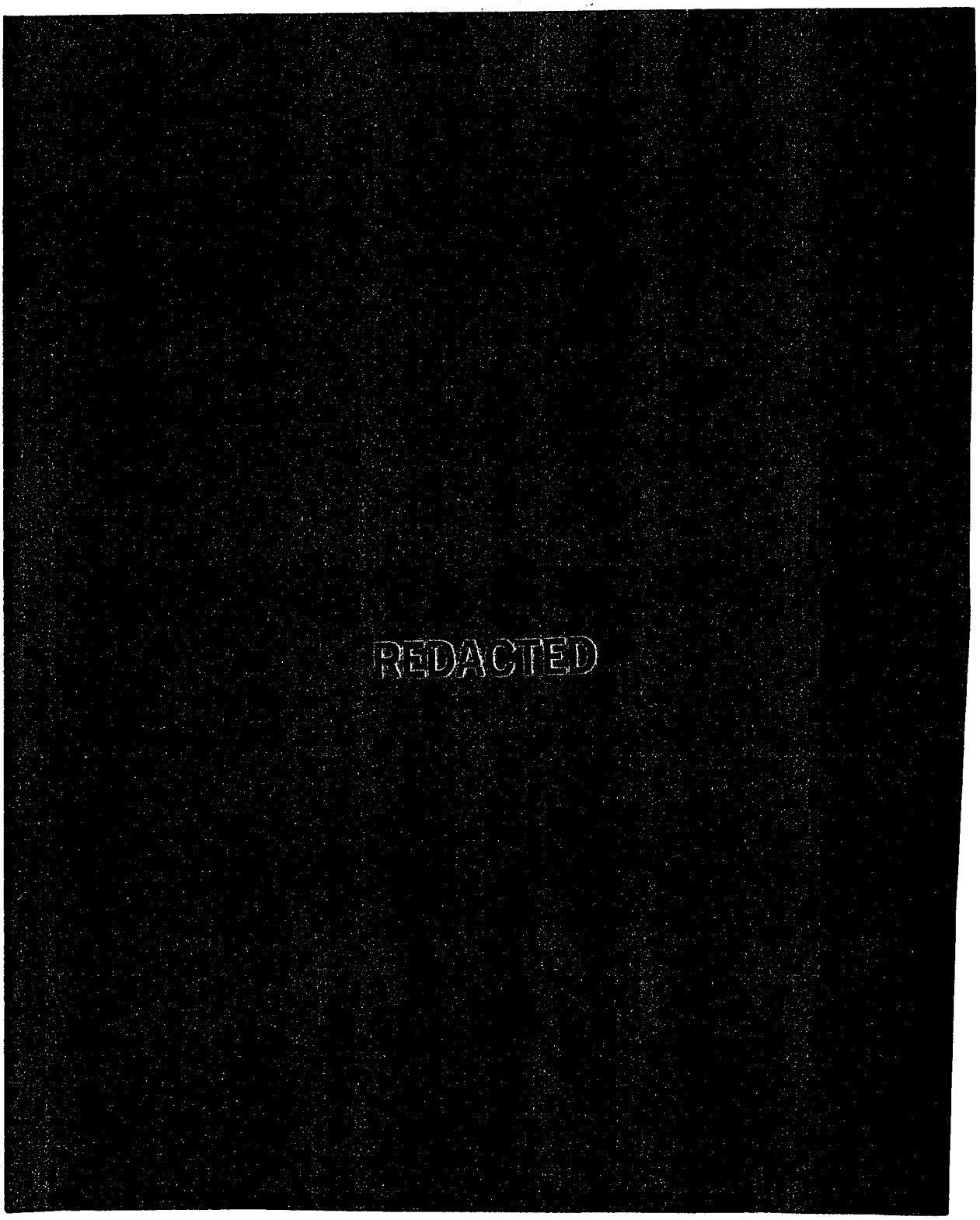
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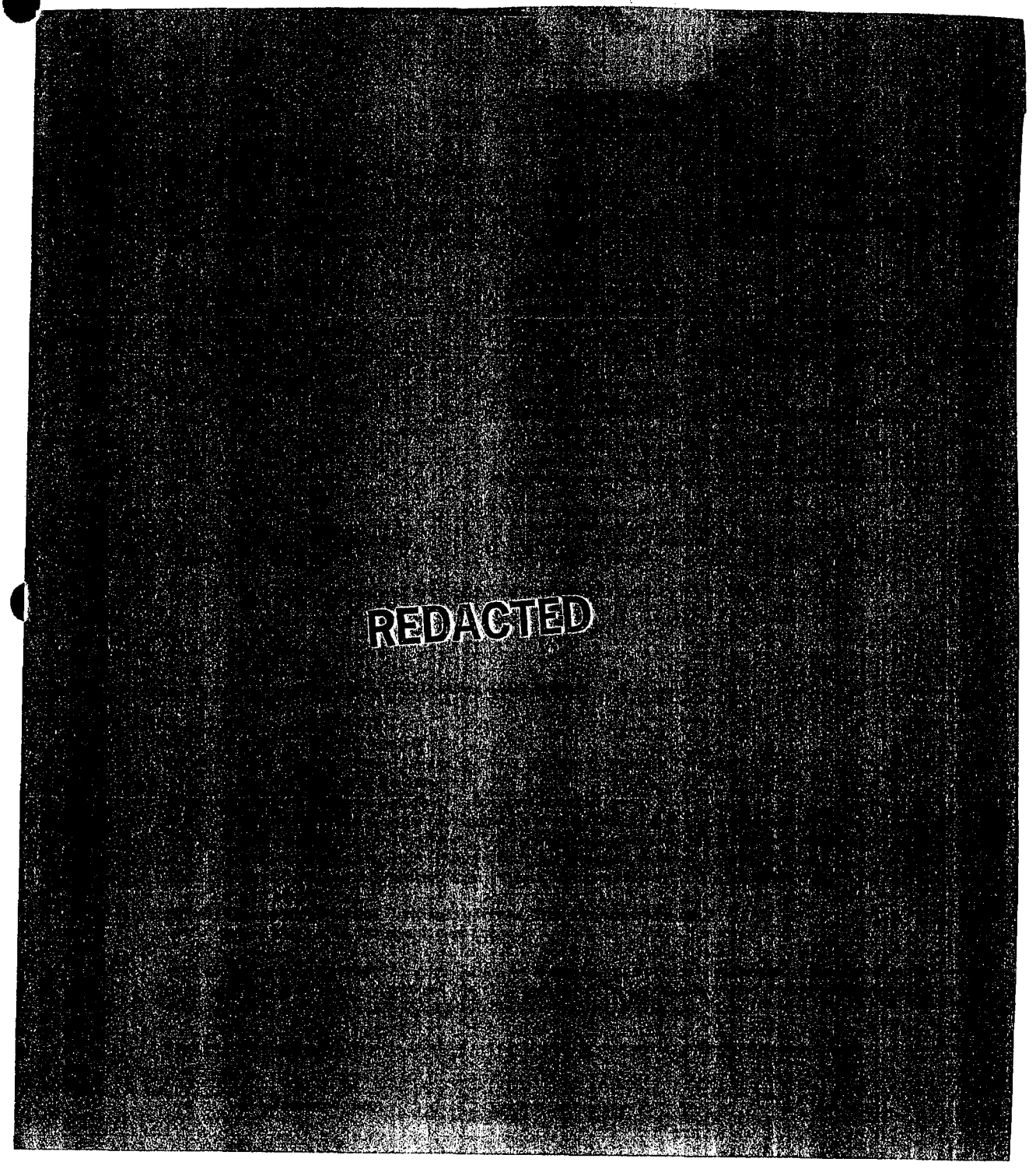
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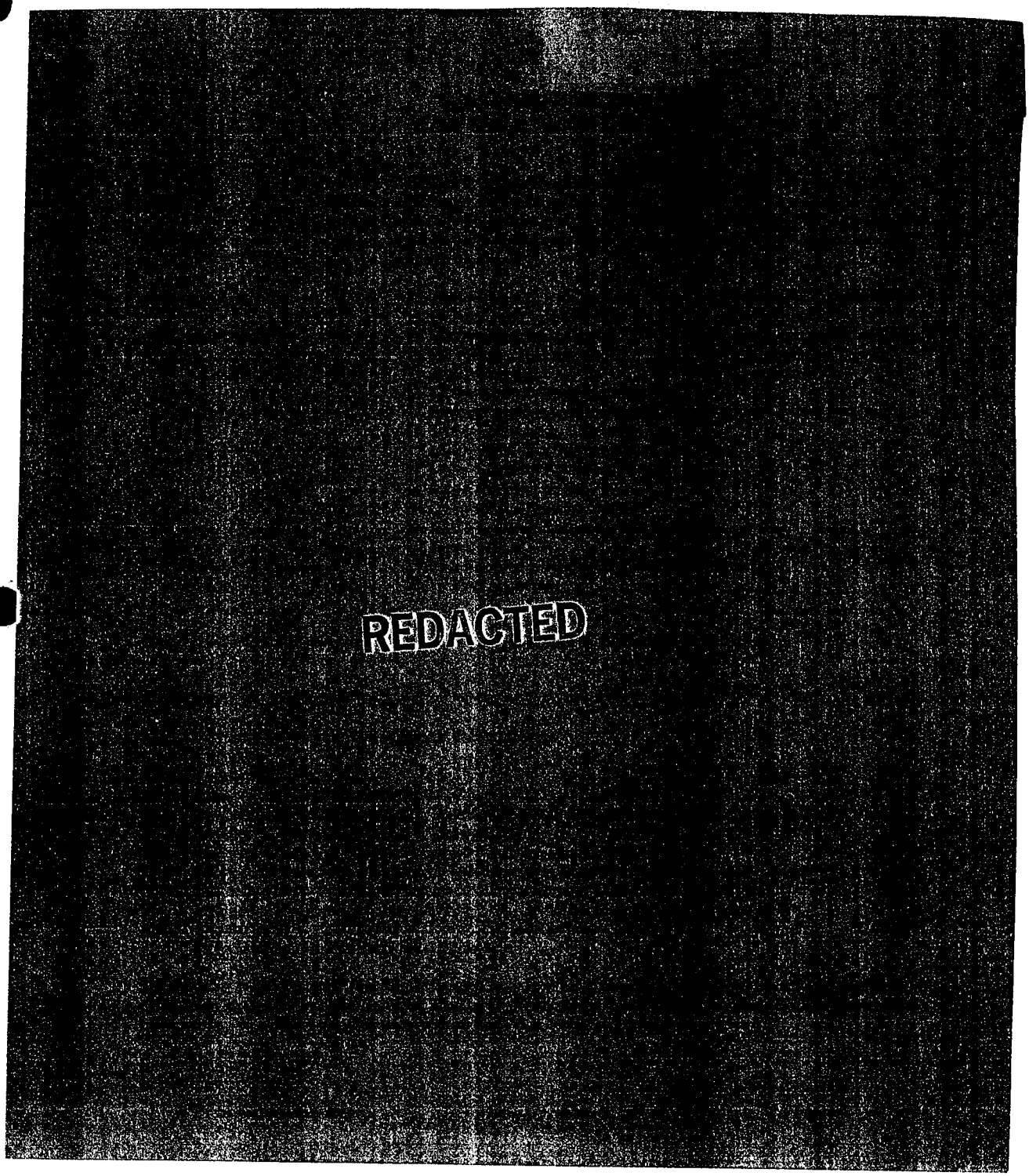
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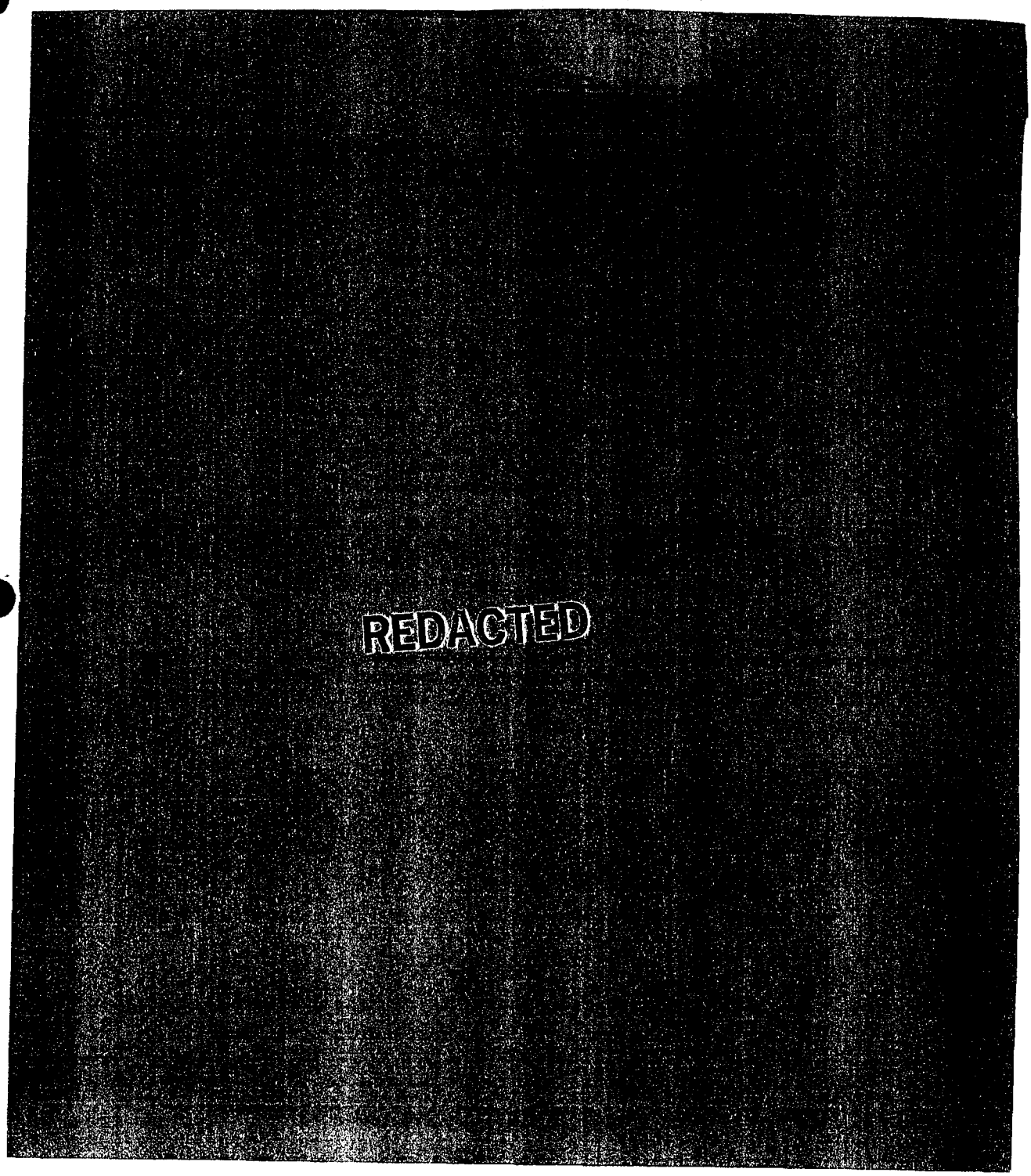
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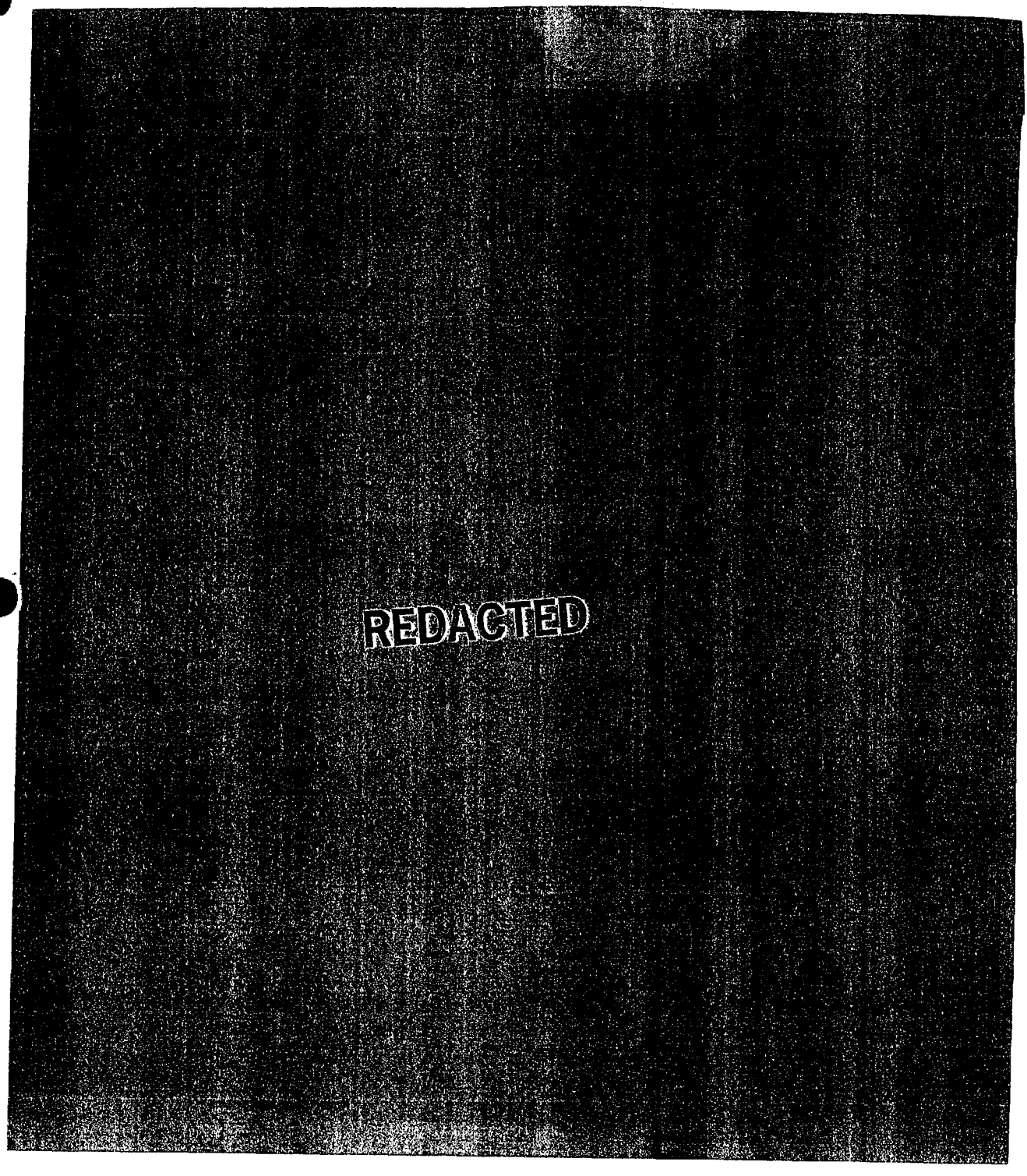
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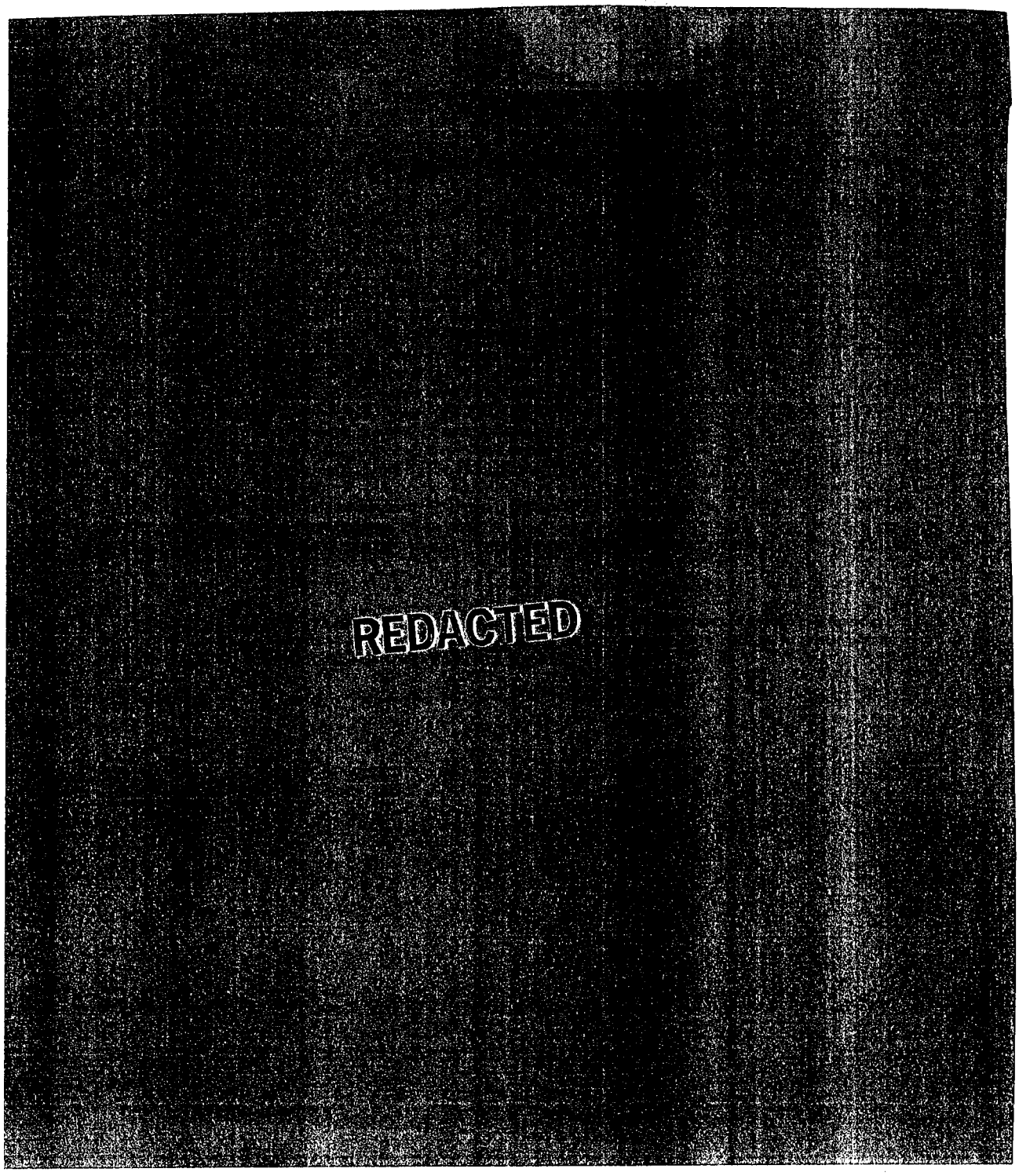
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AREVA

December 8, 2006
AREVA-06-3270

Mr. Danny Roderick
Director – Site Operations
Progress Energy
Crystal River Nuclear Plant
15760 West Power Line Street
Crystal River, FL 34428-6708

Subject: **Proposal for CR3 Engineering Design and Licensing Measurement Uncertainty Recapture (MUR) Power Uprate Project**

Attachment: 1. AREVA NP Proposal for "MUR Power Uprate Project"

References
1. **AREVA NP Letter AREVA-06-2792, Proposal for CR3 Engineering Design and Licensing Measurement Uncertainty Recapture (MUR) Power Uprate Project, October 13, 2006.**
2. **Progress Energy Letter CRVP06-0014, Letter of Intent (LOI) for the CR3 MUR Power Uprate Project, September 21, 2006.**

Dear Mr. Roderick:

AREVA NP Inc. (AREVA NP), an AREVA and Siemens company, is pleased to provide you the attached proposal for CR3 Engineering Design and Licensing MUR Power Uprate Project. This proposal is a revision from the Reference 1 draft issued October 13, 2006. We look forward to your favorable acceptance of this proposal and appreciate this opportunity to work with you on this project. In accordance with Reference 2, AREVA NP has started efforts to complete the CR3 MUR power uprate project for submittal of the license amendment request to the NRC by May 2007.

The attached submittal is a priced version of our proposal for your review. This proposal is valid until December 31, 2006 except that AREVA NP reserves the right to withdraw or amend at any time prior to approval by Progress Energy and subsequent written acceptance by an authorized representative of AREVA NP.

AREVA NP INC.
3315 Old Forest Road, P.O. Box 10935, Lynchburg, VA 24506-0935
Tel.: (434) 832-3000 - Fax: (434) 832-3840 www.areva.com

PEF-NCR-00085

This proposal is proprietary to AREVA NP. If you have any questions concerning this proposal, please contact Dallas Scott at (434) 832-2937 or me at (434) 832-2948.

Sincerely,

Dennis A. Napior
Manager, NSSS Engineering Services
Nuclear Engineering

cc: Jim Terry – CR3
Ted Williams – CR3
Debbie Hanna -CR3
Skip Hudson – AREVA
Dallas Scott – AREVA
Ed Kane – AREVA

September 21, 2006
CRVP06-0014

Mr. Gary Mignogna
Vice President
AREVA NP Inc.
3315 Old Forest Road
Lynchburg, VA 24501

Dear Mr. Mignogna:

This Letter of Intent (LOI) is notice that Progress Energy Service Company, LLC acting as agent for Progress Energy Florida, Inc. (Progress Energy) intends to, in good faith, negotiate a contract with AREVA NP, Inc. (AREVA NP) for AREVA NP to provide services associated with the Measurement Uncertainty Recapture (MUR) Project for Crystal River Unit 3. AREVA NP is authorized to proceed with the MUR work under this LOI as necessary to support the MUR work through December 31, 2006, or until such time that the parties have negotiated in good faith and have mutually agreed upon acceptable contractual terms and conditions for AREVA NP to perform the MUR work, whichever comes first. This LOI shall not be considered as a limitation or exclusion of any subject matter from such negotiations, so long as both parties act in good faith, and this LOI shall not constitute an acceptance of any AREVA NP proposal. The task descriptions and estimates for the near term MUR work are as mutually agreed and provided in Attachment A.

REDACTED

The MUR work will be conducted in accordance with the terms of the Master Services Agreement (MSA) between Progress Energy and AREVA NP Inc. dated August 15, 2003. AREVA will be compensated for the MUR work described in Attachment A in accordance with the MSA's 2006 Master Services Rates, [redacted] The total funding authorized under this LOI is not to exceed [redacted] and may be adjusted by Progress Energy as necessary by written amendment to this LOI. Under no circumstances shall AREVA NP be obligated to perform services or provide equipment that will exceed the funding levels established by Progress Energy under the terms of this LOI as amended.

If after due diligence Progress Energy and AREVA NP fail to agree upon a contract for the MUR work prior to December 31, 2006, Progress Energy may award the MUR work to any other party it may select, without any liability or obligation of any nature to AREVA NP. Progress Energy reserves the right to cancel this LOI at its discretion at any time and/or not enter into a contract with AREVA NP for the MUR project. In the event of a cancellation of this LOI or failure of parties to agree to a final contract, Progress Energy agrees to pay AREVA NP for the work performed by AREVA NP to the date of cancellation together with reasonable termination costs incurred by AREVA NP to bring the work to a close. Progress Energy's obligation to pay AREVA NP for MUR work performed to the date of cancellation shall not be dependent on AREVA NP completing any task, or Progress Energy accepting any such MUR work. In the event of a cancellation, neither party will make a claim against nor be liable to the other for any losses or damages suffered by it because of the termination of the negotiations without a final contract. In no event shall Progress Energy have any liability to AREVA NP unless a contract for the MUR work is executed by Progress Energy and AREVA NP.

Please signify your agreement to the above by having an authorized representative of AREVA NP sign below and return a copy to the undersigned. The commitments set forth above shall expire and become void if an unmodified copy of this LOI with an authorized signature of AREVA NP is not returned to the undersigned by October 1, 2006.

Please return to Tony Owen, Progress Energy Service Company, P.O. Box 1551 (PEB-2C3), Raleigh, NC 27602.

Sincerely,

_____

Dale E. Young
Vice President

Accepted:

AREVA NP Inc.

By: _____

Name (printed): _____

Title: _____

Date: _____

Should the person's title who is executing this document not indicate that he/she is a corporate officer, an affidavit signed by a corporate officer shall be provided stating that the person whose name appears above is duly authorized to execute Contracts on behalf of the firm.

ATTACHMENT A

- Task 1 Scope Description: Systems Engineer-Design Engineer Interviews
  T&M Estimate: 260 manhours [redacted] T&L and materials
- Task 2 Scope Description: Consultant – ER Kane
  T&M Estimate: 450 manhours
- Task 3 Scope Description: Project Management
  T&M Estimate: 850 manhours [redacted] T&L and materials
- Task 4 Scope Description: NSSS Systems Evaluations
  T&M Estimate: 1750 manhours
- Task 5 Scope Description: Safety Analysis
  T&M Estimate: 1278 manhours
- Task 6 Scope Description: Thermal Hydraulics
  T&M Estimate: 1850 manhours
- Task 7 Scope Description: Materials Safety Analysis and MRR FIV
  T&M Estimate: 556 manhours
- Task 8 Scope Description: Fluence Radiation Analysis
  T&M Estimate: 328 manhours
- Task 9 Scope Description: Fuel Analysis
  T&M Estimate: 3200 manhours
- Task 10 Scope Description: BOP Mechanical System, Structural
  T&M Estimate: 1232 manhours
- Task 11 Scope Description: BOP I&C
  T&M Estimate: 764 manhours
- Task 12 Scope Description: BOP Electrical
  T&M Estimate: 1000 manhours
- Task 13 Scope Description: Engineering Change
  T&M Estimate: 3956 manhours
- Task 14 Scope Description: Caldon Installation
  T&M Estimate: [redacted] FP pre-deployment, $1M Time and Materials (Site Work)

Total estimate of work described in Attachment A: [redacted]

REDACTED

REDACTED

CONFIDENTIAL

All MUR Items

Task #	Task, or Action, Description	Action Assignment	Corp	Task Due Date / Actual Comp Date	Action Resolution	I or R	Comments
1	Follow up on FAC measurement requirements for 15R and applicable code case exemption if required. Is FAC performed at 2568 or 2619 MWth?	J. Mueller	Prog	11/30/2006 11/20/2006	FAC Check Plus is being ran by AREVA with an expected completion of 2/8/07. If analysis shows unnacceptable results, an EC/ED will be assigned to J. Mueller to document acceptability based upon inspection program and results as described above.	I	1. The Checworks model has been ran at 100% power corresponding to a steam production rate of 10.7828 MLb/Hr. To the best of my knowledge it has not been run at higher levels. This is what we wanted AREVA to do as part of the project, 1) Determine the new operating parameters 2) plug them into Checworks and determine if we are OK till 16R. 2. Code Case N-597-1 can be interpreted to allow us to reduce our minimum wall by 10% for one operating cycle which would get us to 16R. We have not found an example where this has been tried to completion. Several examples where companies submitted the relief request for a similar situation but retracted it before a ruling was made. 3. Wall thickness measurements are routinely done as part of the FAC program. These measurements are used to calibrate the model. The piping in question has been inspected during the last couple of outages. Based on these inspections, the wear rate and min wall have been used to predict a conservative service life beyond 16R. These inspections will be continued in R15. These inspections will be used with the wear rate to update the service life. Bottom line is that with current inspection data Checworks is not required.

PEF-NCR-00090

Task #	Task, or Action, Description	Action Assignment	Corp	Task Due Date / Actual Comp Date	Action Resolution	I or R	Comments
2	Provide letter to AREVA on fuel analysis costs breakdown for DNB mapping and normal reload task performance. Expectation of splitting DNB mapping with NFM&SA. All normal task reviews should be charged to fuel reload contract not to MUR. Expect [redacted] costreduction for DNB mapping and [redacted] reduction for Core reload task reviews.	John Siphers	PROG	12/8/2006 / 11/28/2006	Costs were explained and justified as only analysis required to support MUR are being charged to MUR project. AREVA is to provide a list of analyses perfroemd at 100% operating conditions and anlyses perfroemd at 102% accident conditions. NFM&SA will be charged for 3RCP DNB mapping.	I	Action from Exec. Review Meeting on 11/17/06
3	Provide justification for changing out MS pressure transmitters and change to HB analysis.	George Hildebrandt	AREVA	12/8/2006 / 11/26/2006	MS pressure transmitters will be installed to improve heat balance uncertainty by approximately 0.15%. Current heat balance uses less accurate transmitters and averages OTSG outlet and TG throttle pressures which adds a conservative bias to the existing heat balance.	I	Action from Exec. Review Meeting on 11/17/06
4	Determine the need to perform FW piping load analysis evaluation.	T. Bilger	AREVA	12/8/2006 /		I	Action from Exec. Review Meeting on 11/17/06
5	Post changes to Calculations only. Revise calcs only if need to support uprate to 2609MWth. Calcs will be revised as part of uprate to 3010.	AREVA.CR3	REVA/PRO	/ 11/17/2006		I	Action from Exec. Review Meeting on 11/17/06

REDACTED

PEF-NCR-00091

Task #	Task, or Action, Description	Action Assignment	Corp	Task Due Date / Actual Comp Date	Action Resolution	I or R	Comments
6	Provide a listing of all currently identified affected calculations.	V. Esquillo	AREVA	12/8/2006		I	Action from Exec. Review Meeting on 11/17/06
7	Provide Metrics and Performance Measures to AREVA	Ribin Kibler	PROG	11/30/2006 11/21/2006	SGR project PIs sent to AREVA as examples	I	Action from Exec. Review Meeting on 11/17/06
8	Update Issues and Restraints and provide copy to D. Roderick	Ted Williams	PROG	12/8/2006 12/7/2006	Emailed to D. Roderick	I	Action from Exec. Review Meeting on 11/17/06
9	Initiate formal project review phone call Bi-Weekly.	D. Scott	AREVA	12/8/2006		I	Action from Exec. Review Meeting on 11/17/06
10	Develop Milestone and payment schedule with incentive and penalties.	Ted Williams	PROG	12/7/2006 12/6/2006	Sent milestones and recommended Incentive and penalties to AREVA and corproarte Contracts.	I	Action from Exec. Review Meeting on 11/17/06
11	Develop best estimate Invoice through December 2006	D. Naplor/T. Williams	AREVA	12/7/2006	Estimated [redacted] through December. Nov and Dec Accruals sent to D. Taylor and T. Suits	I	Action from Exec. Review Meeting on 11/17/06
12	Develop Fixed price proposal and present at executive review on 12/08/06.	D. Napior	AREVA	12/8/2006		I	Action from Exec. Review Meeting on 11/17/06

REDACTED

PEF-NCR-00092

Task #	Task, or Action, Description	Action Assignment	Corp	Task Due Date / Actual Comp Date	Action Resolution	I or R	Comments
13	Issue AREVA contract by 12/15/06.	T. Owen	PROG	12/15/2006		I	Action from Exec. Review Meeting on 11/17/06
14	Post changes to Calculations only. Revise calcs only if need to support uprate to 2609MWth. Calcs will be revised as part of uprate to 3010.	AREVA.CR3	REVA/PRO	11/17/2006		I	Action from Exec. Review Meeting on 11/17/06
15	Provide a listing of all currently identified affected calculations.	V. Esquillo	AREVA	12/8/2006		I	Action from Exec. Review Meeting on 11/17/06
16	Initiate formal project review phone call Bi-Weekly.	D. Scott	AREVA	12/8/2006		I	Action from Exec. Review Meeting on 11/17/06
17	Deliverables, DOR, will be places in P3 Project Schedule	Amy Vassiliou	AREVA	12/8/2006		I	
18	Core delta T change due to board replacement	Jim Wiemer	AREVA	12/13/2006		I	
19	Check on bases for current LOCA M&E to RB to rerun as Task 5.09.07	T Williams	PROG	11/17/2006	LOCA M&E and RB response will be re-analyzed. If other B&W fleet stations need the new parameters and anlaysis, PGN will be reimbursed based on participation similar to previous BWOG project splits.	I	

PEF-NCR-00093

Task #	Task, or Action, Description	Action Assignment	Corp	Task Due Date / Actual Comp Date	Action Resolution	I or R	Comments
20	NRC SER Letter for App R	K Wilson	PROG	12/14/2006		I	
21	Check Plus May need code case exemption for FAC FW piping.	K Wilson	PROG	2/15/2007		I	
22	Do we use SQA EGR 157 for Caldon Software use Separate EC?	Susan McPherson	PROG	1/30/2006 11/17/2006		I	
23	Break down comparisons between CR & Robinson	AREVA	AREVA	11/17/2006	Comparison breakdown was provided at 11/17/06 Exec review mtg. This comprison also formed the bases for contract costs with escalation and use of outside vendor.	I	
24	Has RCP pump heat been included in SGR project?	B Lemberger	PROG	1/15/2007		I	
25	Do we need to do calc's for 32/51 docs or simply use owner acceptance or ECED?	K Wilson	PROG	1/15/2007 12/6/2006	AREVA will provide draft mark ups for EDBDs, procedures, FSAR. These documnts will be processed by CR3 as part of EC ADL. AREVA calcs will be issued to CR3 and processed through OWNER ACCEPTANCE.	I	
26	LAR template, submittal, and approval process.	K. Wilson	PROG	3/7/2007		I	
27	RCP pump heat will be documentated in HB uncertainty analysis by J. Wiemer at 21 MW.	J. Wiemer	AREVA	11/17/2006		I	

Task #	Task, or Action, Description	Action Assignment	Corp	Task Due Date / Actual Comp Date	Action Resolution	I or R	Comments
28	Comment 13 on EPU study needs to specify which Mwe to use.	T Willlams	PROG	12/6/2006	PEPSE out put yields 903 MWe at 2568 MWth and 914MWe at 2609 MWth. Current station performance yields 900MWe at 68F CW inlet temp. Comparison for MWe output increase will be based upon an expected 11MWe increase with no changes other than thermal power increase.	I	
29	Create a MUR Level 3 schedule.	C Goering	PROG	1/19/2007		I	Including AREVA level 3 Schedule.
30	Coordinate with the fossel units on Temp mitigarion at POD. (helper cooling towers)	K Wilson	PROG	1/15/2007		I	This action is part of EPU
31	Cost breakdown for POD	K Wilson	PROG	12/15/2006		I	This action is part of EPU

PEF-NCR-00095

AREVA - Extended Power Uprate

Crystal River Three CR#3

Executive Summary

July 28, 2007

Nuclear Steam Supply System Engineering,
Fuel Engineering and
Support for the Licensing Amendment Request

Progress Energy

AREVA – EPU CR-3

Scope

Contractor will provide all necessary computer codes, calculation basis and expert personnel to perform the following functions:

- Nuclear Steam Supply System (NSSS) Engineering
- Fuel Engineering
- Support of the Licensing Amendment Request (LAR)

To complete the primary side studies for EPUR.

AREVA – EPU CR-3

Project Schedule and Milestone Schedule

Project Schedule

- Work began February 27, 2007
- Work shall be completed no later than May 1, 2012

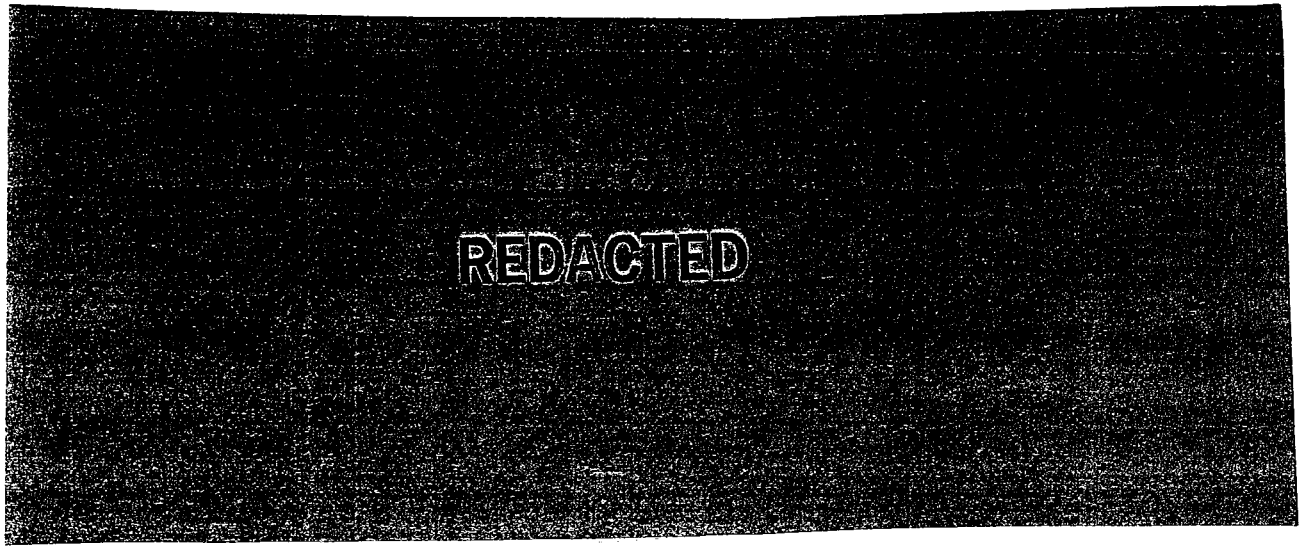
Milestone Schedule/Payment Schedule

- The Milestone Schedule is the same set of events/deliverables as the Payment Schedule for the fixed price work
- This schedule is provided below on the slide "Payment Terms"
- If the Milestone/Payment Schedule is not met then that payment is delayed until the deliverable is complete

Progress Energy

AREVA – EPU CR-3

Pricing



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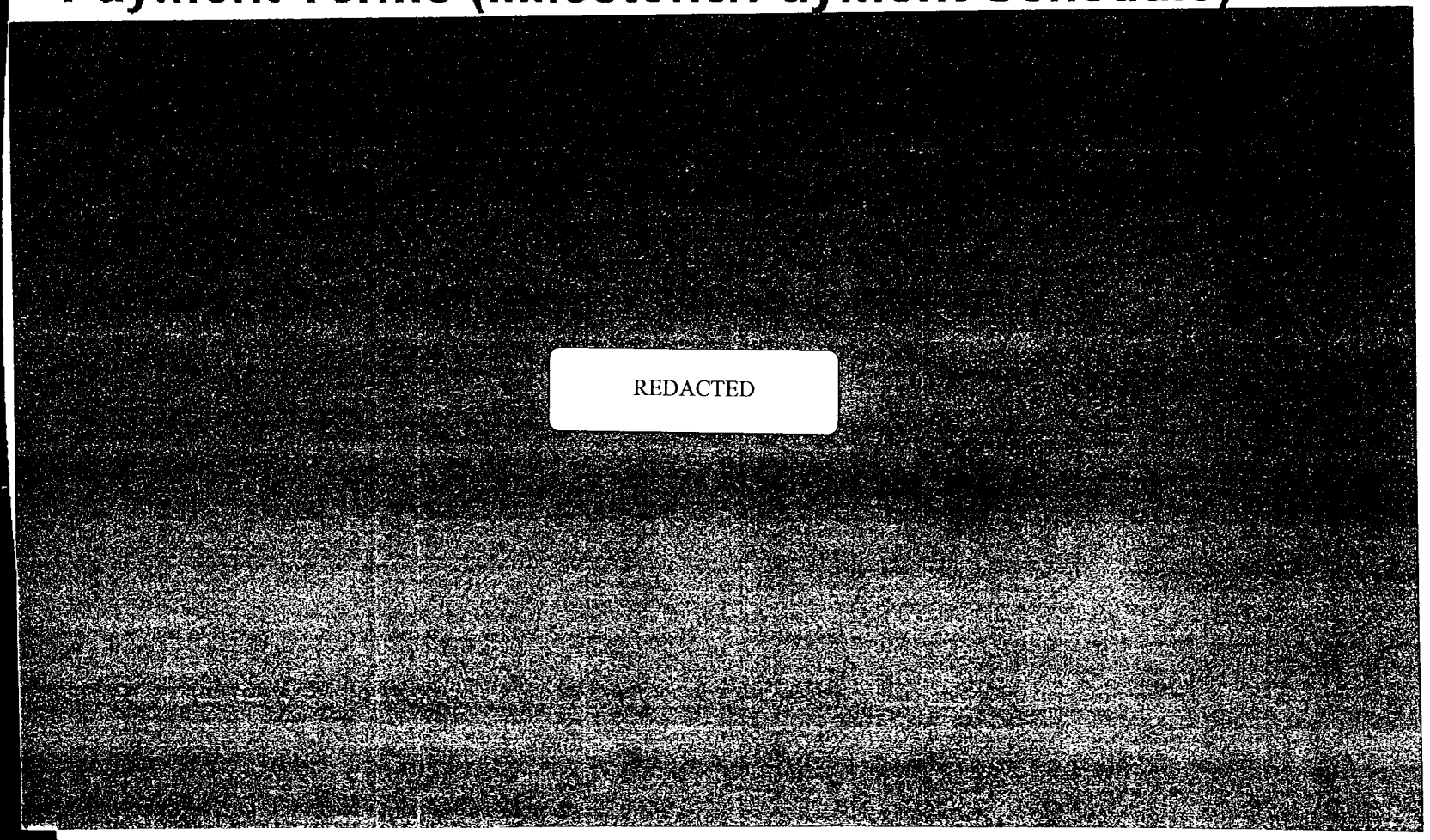
AREVA – EPU CR-3

Payment Terms (Milestone/Payment Schedule)



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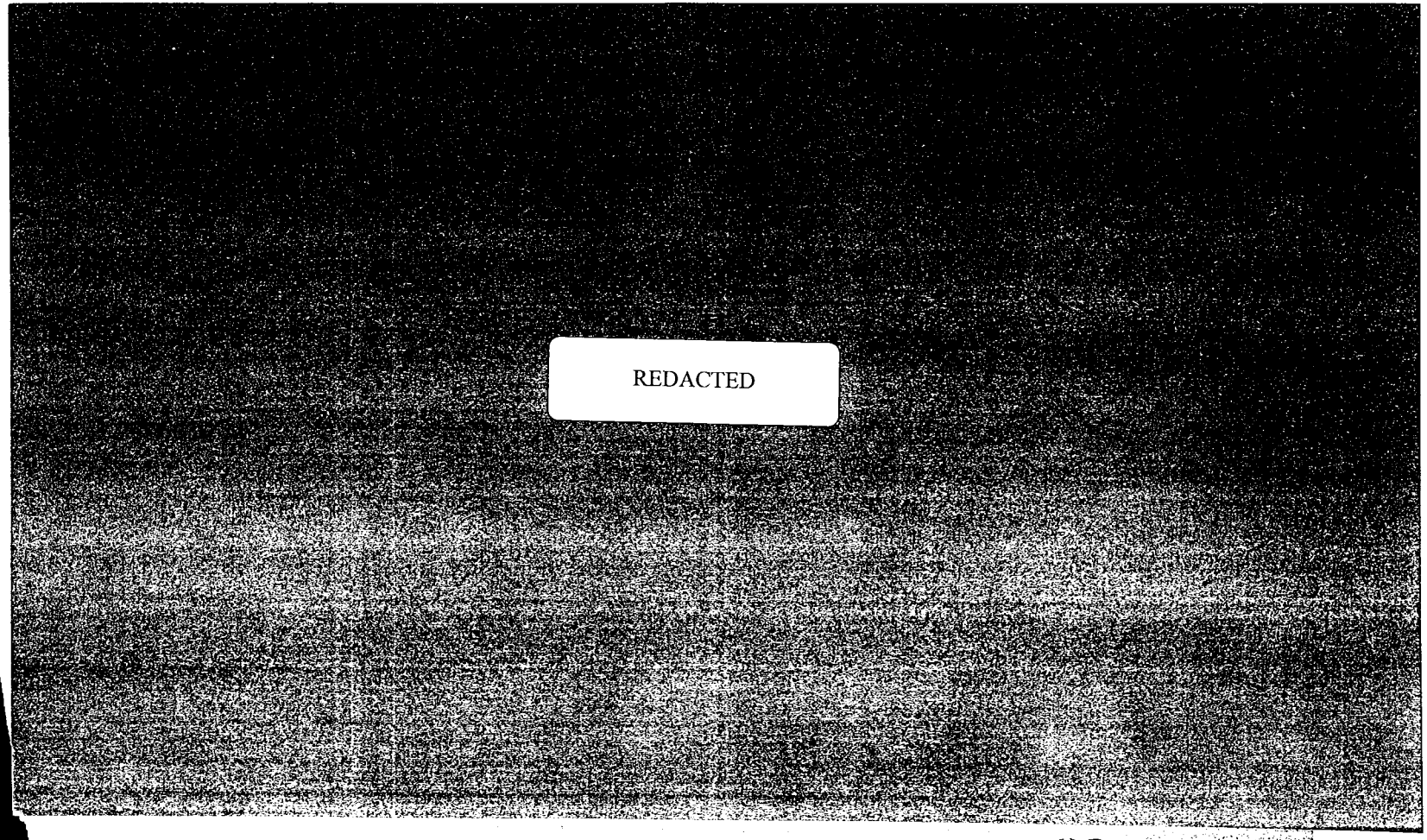
AREVA – EPU CR-3

Payment Terms (Milestone/Payment Schedule)



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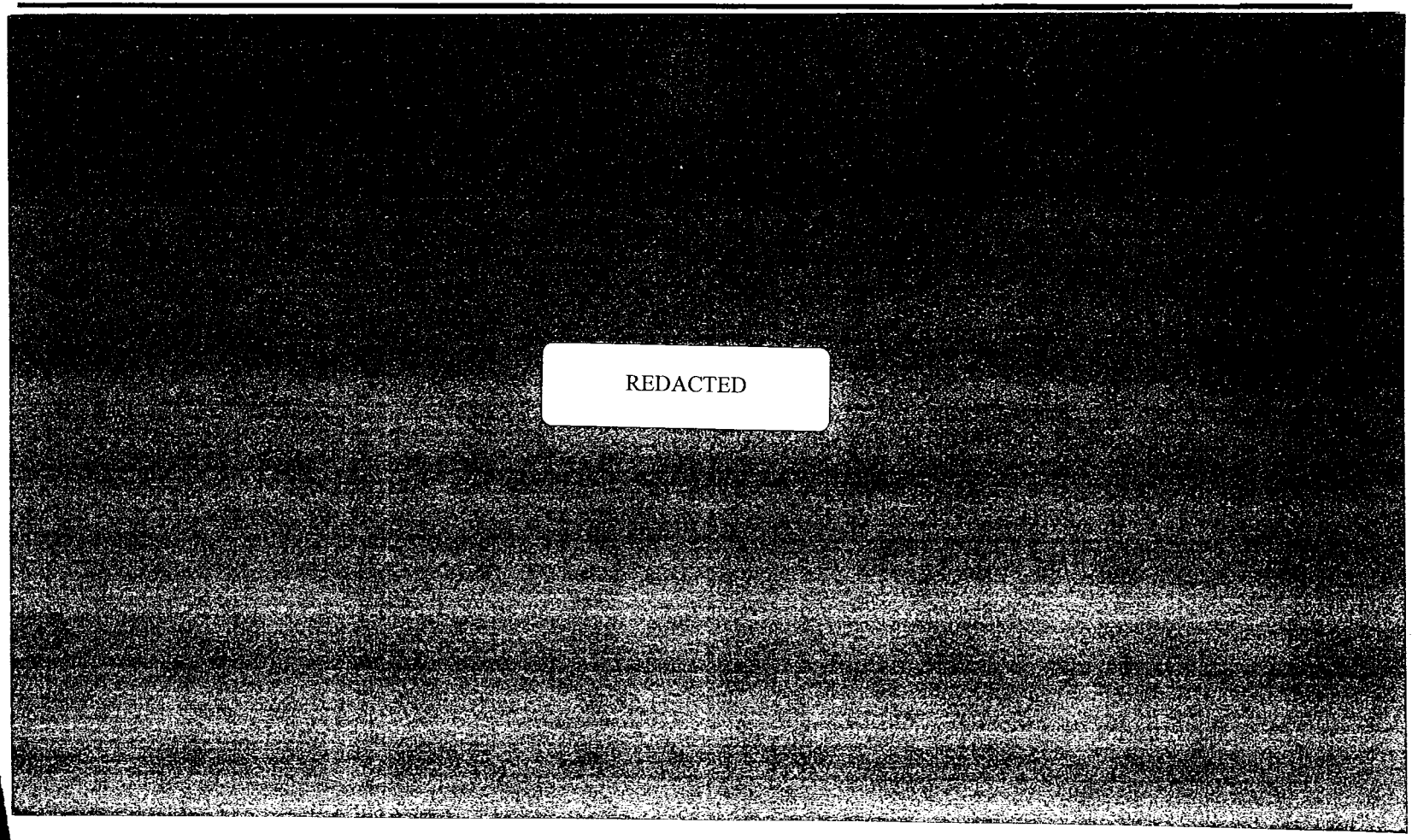
AREVA – EPU CR-3



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AREVA – EPU CR-3

Payment Terms

Actualized LOI Charges to July 22, 2007

Task	Manhours	Price	Type
RW SYSTEM DESIGN	64.0	REDACTED	T&M
BORON PRECIPITATION DESIGN	56.5		T&M
RB VOLUME & SURFACE AREA	28.0		FFP
APP R CD for ADV	185.0		FFP
CALCULATION EVALUATIONS	197.0		FFP
SEC SIDE BLOWDOWN (Fast Cooldown)	412.9		T&M
ARTS ARMING SETPOINT	118.0		FFP
PM & SCHEDULER	366.0		FFP
THERMAL- HYDRAULICS	388.5		FFP
SAFETY ANALYSIS	558.5		FFP
FUEL ANALYSIS	631.0		FFP
ADDITIONAL WORK COMPLETED TO ABOVE			T&M
TOTAL	**3,005.40**		

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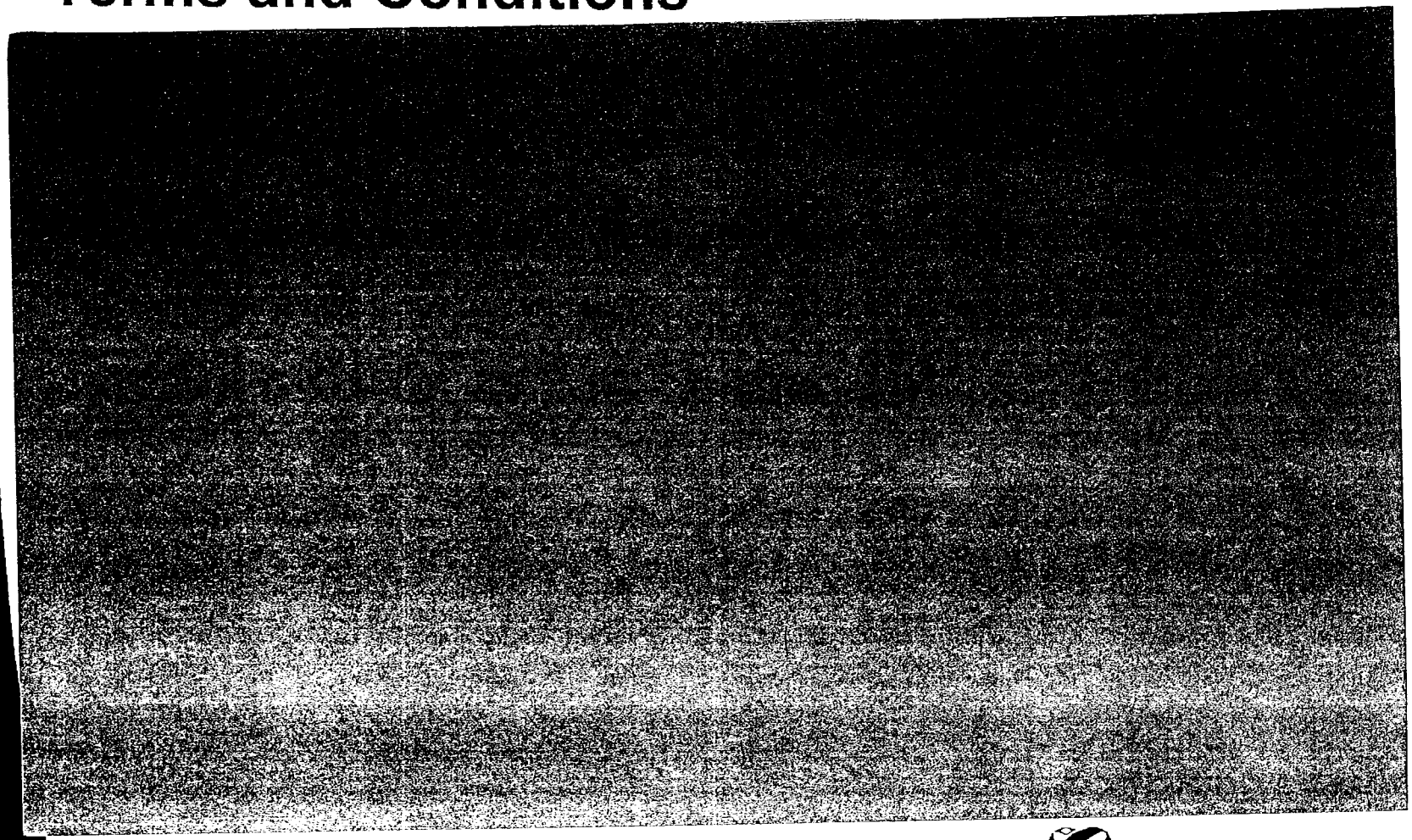
Progress Energy

AREVA – EPU CR-3

Terms and Conditions



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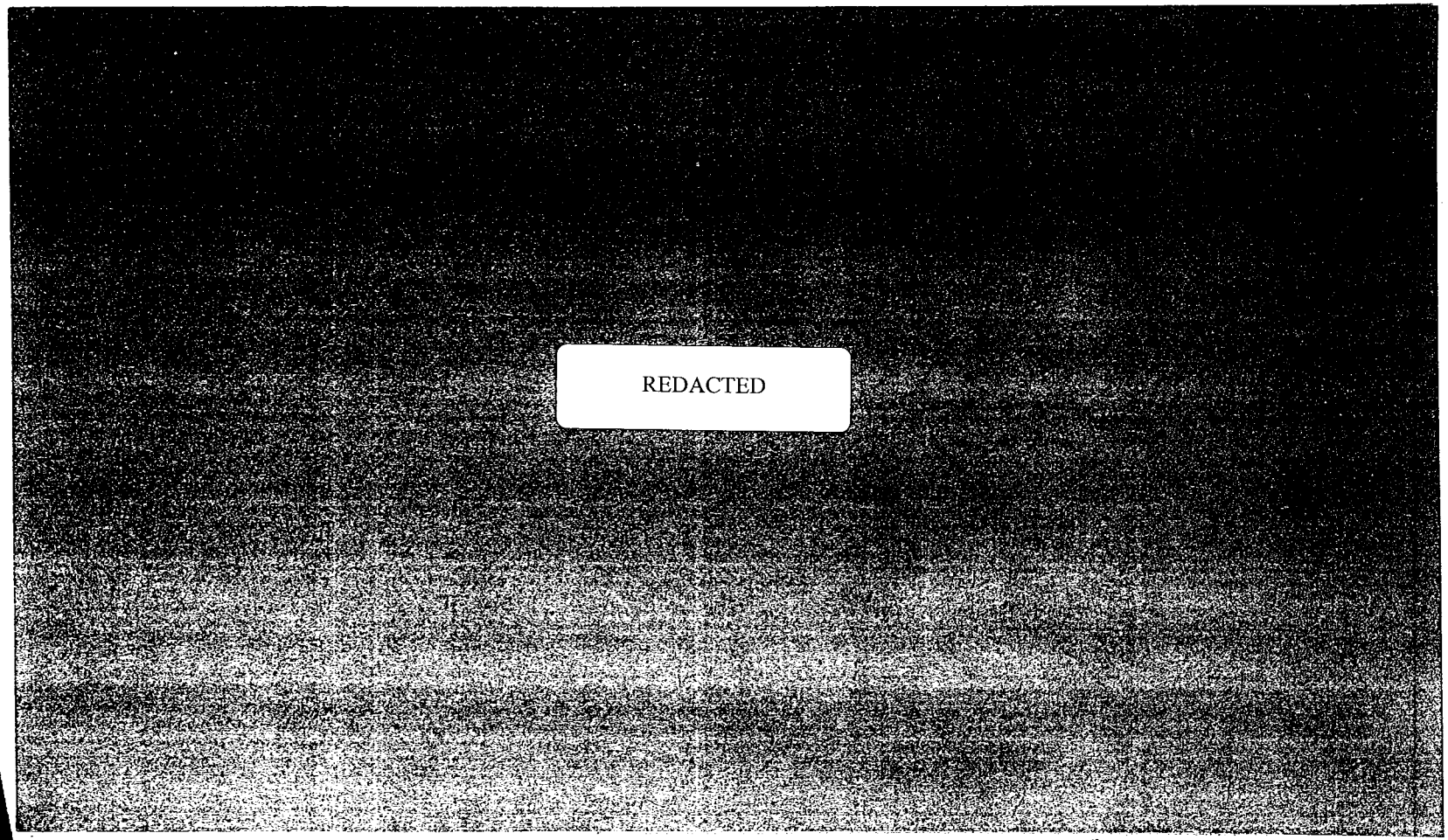
AREVA – EPU CR-3

Performance Guarantee



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Progress Energy

AREVA – EPU CR-3

Sole Source Justification

Contractor owns exclusive licensing and possesses exclusive rights to data, processes and patent rights.

The computer codes used for Safety Analysis are proprietary and would be cost prohibitive to have these re-developed.

Westinghouse provide a letter stating they could not perform without extensive work and cost to get the required codes, etc.

AREVA – EPU CR-3

Costing Approach

AREVA was required to "open their books" on hours and Rate Classifications for all aspects of the Work.

All phases of work and associated hours were reviewed with AREVA and a panel from PE.

AREVA's price for the total package was initally [redacted] Agreements were reached to remove the proposed incentives ([redacted]) and perform the expanded (current scope) for [redacted] Approximately [redacted] off the original price.

REDACTED

REDACTED

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Progress Energy

AREVA

- **Purpose- The purpose of this meeting is to outline information and approach going forward on the Crystal River 3 Power Uprate, supporting power increase objectives**

- **Process- As a team, we will review the status of the MUR and EPU**

- **Payoff – Clear understanding of the MUR and EPU Status supporting CR 3 power increase objectives.**

AREVA

AGENDA

Introduction	Gary Mignogna	10:00-10:15pm
MUR Status	Dallas Scott/ Ken Wilson	10:15-11:00pm
NSSS Evaluations	Ed Kane/ Dallas Scott	11:00-11:30am
Post-LOCA Boric Acid Precipitation	Ed Kane	11:30-1:00am (lunch @12)
Fast Cooldown	Ed Kane	1:00-1:30am
EPU Environmental Permit Activities	Ken Wilson	1:30-1:45pm
EPU Contracting Status	Ted Williams	1:45-2:00pm
BOP Phase 1 Evaluations	Ed Kane/ Ray Stewart	2:00-2:30pm
Wrap up/Next steps	Gary Mignogna	2:30-3:00pm

CR3 MUR STATUS 7-12-07

- MUR Project Status
  - LAR Status – Ken Wilson
  - MUR Project Status – Dallas Scott
  - Deliverable Status – Dallas Scott
- Summary – Dallas Scott

PEF-NCR-00111

- SUBMITTED MUR LAR APRIL 25
- EXCELLENT AREVA SUPPORT TO MEET A VERY AGGRESSIVE SCHEDULE
- MET WITH NRC ON APRIL 27 TO DISCUSS REGULATORY ASPECTS OF ALL MAJOR PROJECTS
  - MEETING WENT VERY WELL

- NRC RECEPTIVE TO MEETING SIX MONTH SCHEDULE WITH A COUPLE OF CAVEATS
- PE-F NEEDS TO SUBMIT COMMITTED SUPPLEMENTS ON SCHEDULE
  - GRID RELIABILITY DRAFT IS COMPLETE
  - ALDEN TESTING REMAINS ON SCHEDULE FOR JULY WITH EARLY AUGUST REPORT

- TWO 'TECHNICAL' CHALLENGES IDENTIFIED BY THE NRC. THESE ARE DEPARTURES FROM 'PLAIN' MUR LAR
  - ATTACHMENT SUPPORTING AMSAC DOES NOT REQUIRE APPROVAL. WE'LL LIKELY WITHDRAW.
  - LOCA MASS AND ENERGY/CONTAINMENT ANALYSIS THOUGHT TO ADD SCOPE TO THEIR REVIEW
    - METHOD RELIES ON AN APPROVED TOPICAL
    - ONLY OPEN ASPECT IS INPUT ASSUMPTION
    - MAY ADDRESS UNDER 50.59 OR SPLIT REVIEW OUT

MURPHY POWER UPRATE REQUEST

- SUBMITTED MUR LAR APRIL 25
- NRC ACCEPTANCE REVIEW UNDERWAY
- INITIAL REVIEW WAS NOT POSITIVE
- REVISED LAR SUBMITTED JUNE 27
- SUBSEQUENT FEEDBACK WAS POSTIVE
- CURRENT SCHEDULE [DOES OR DOES NOT] SUPPORT START-UP WITH MUR

- ONLY CLEARLY OPEN ITEM WITH NRC IS CONFIRMATION OF ALDEN RESULTS
- PRELIMINARY RESULTS ON 'B' TRAIN WERE NOT ACCEPTABLE
  - FLOW STRAIGHTENER MAY BE PROBLEM
  - AREVA/PE-F SUSPECT LAB CONFIGURATION
  - RE-TEST UNDERWAY [SHOULD HAVE RESULTS BEFORE MEETING]

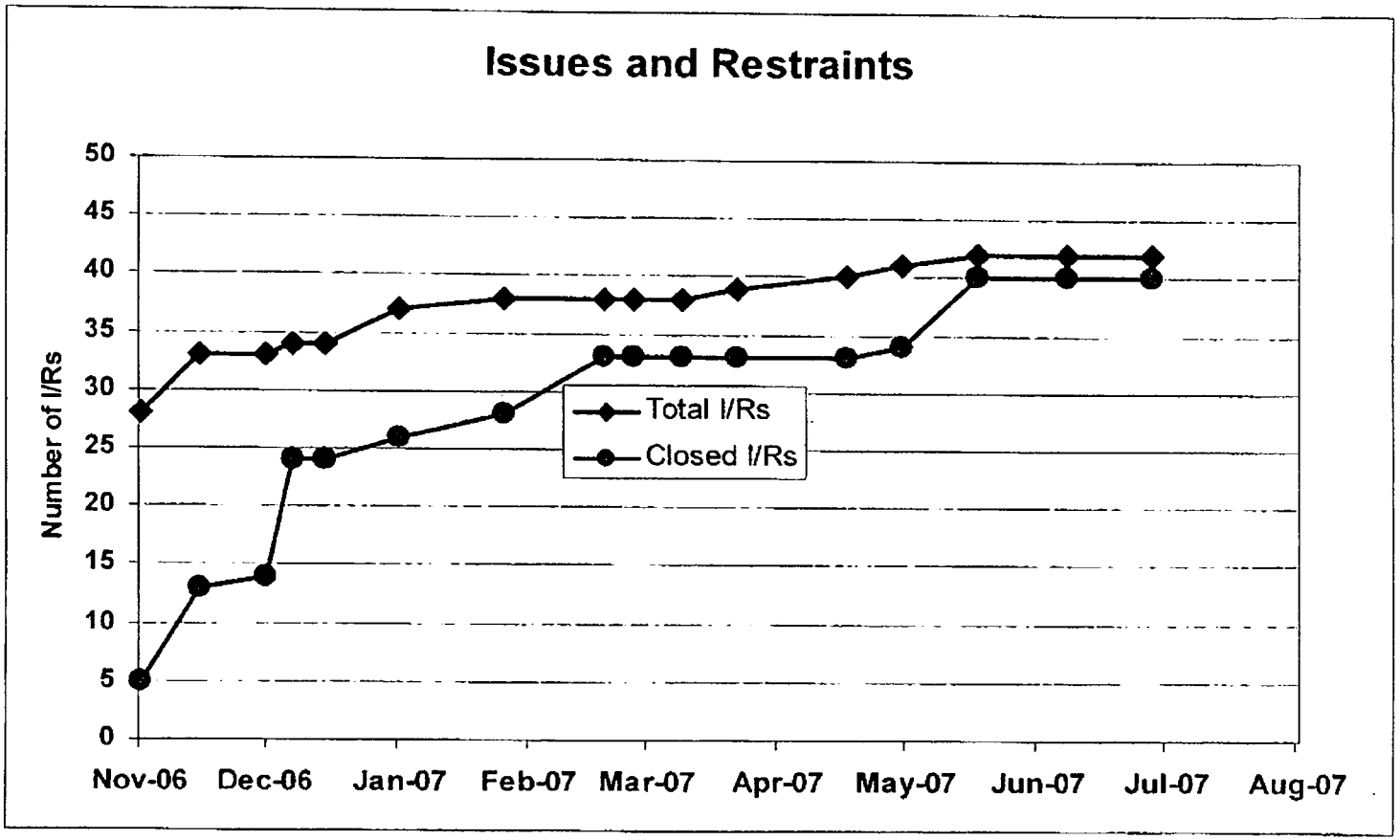
- PE-F DISAPPOINTED WITH OUR EFFORTS TO COMMUNICATE WITH STAFF\
- WEEKLY TELECONS ESTABLISHED
- "MONTHLY" MEETINGS BEING SET-UP TO ADDRESS MUR AND EPU (STAND-ALONE MOD CONCEPTS, ETC)
- PM WILL BE ON SITE IN JULY
- MEETINGS WILL START IN AUGUST

MUR Issues and Restraints

Item #	Issue	Source	Applicable System or Document	Responsible Individual	Scheduled Completion Date	Actual Completion Date	Comments
41	Evaluate the need to revise the Heat Balance uncertainty calculation after the Caldon Flow meter is tested.	General Discussions	HB Calc	Weimer/CR3	7/20/2007		Assuming the test numbers are lower (better) than the prelim numbers, it would behoove CR-3 to re-calc the HB because it will (likely) provide some margin for losing some instrumentation and still maintain a 0.4% uncertainty.
42	FIDMS does not work on the simulator.	General Discussions	HB Calc	Larry Creasy	7/20/2007		
43	FAC Evaluation did not include ARD	CSI Evaluation	MFW	Loseke / Richardson			

MUR Project Status

MUR Issues and Restraints



AREVA

MUR Project Status

❖ MUR Status

- ➢ Schedule handout showing remaining tasks provided for later review
- ➢ LAR No. 296 submitted to the NRC for review
- ➢ RAIs being responded to upon receipt
  - RB maximum pressure response re-analyzed
- ➢ MS P&T 100% DRB completed 6/19/07 to meet incentive
- ➢ MUR EC 100% DRB completed 6/21/07 to meet incentive
- ➢ Caldon EC 100% DRB complete 7/5/07 to meet incentive
- ➢ FIDMS acceptable operation in Simulator

More MUR LAR RAIs expected; ECs on track.

PE Support outstanding to meet schedule.

MUR Overall Status

- MUR LAR is submitted to NRC for review.
- FIDMS programming is installed in CR3 Test Lab.
- Caldon EC is 100% DRB complete and on schedule.
- MUR EC is 100% DRB complete and on schedule.
- ICS EC 60% complete and on schedule.
- MS P&T EC 100% DRB complete and on schedule.

AREVA

MUR Project Summary

REDACTED

- Approximately [redacted] T&M effort billed for 2006. Five Fixed Price milestone payments invoiced four for [redacted] each and one for [redacted]. One T&M 2007 invoice [redacted] for I&C Heat Balance Uncertainty Calculations.
- LOCA M&E Incentive 11/14 of 1%
- Containment Response Incentive 1%
- Draft LAR Incentive 1%
- FIDMS Version 1.8 Installed at CR3 NIT Lab Incentive 1%
- MS P&T EC 100% DRB 1%
- MUR EC 100% DRB 1%
- Caldon EC 100% DRB 1%
- No Schedule Incentive Later than 7 days late 2%

REDACTED

REDACTED

EPU NSSS

PEF-NCR-00123

EPU NSSS

- Project goal – Kane
- LOI status – Kane/Scott
- Issues and Restraints - Kane
- NSSS Proposal Status - Scott
- Summary - Scott
- Boron Precipitation - Kane
- Fast Cooldown – Kane
- Environmental Permits – Ken Wilson
- EPU Contracting Status – Ted Williams
- BOP Phase 1 Evaluations – Kane/Stewart
- Summary Wrap up - Mignogna

EPU NSSS

- **Project Goal – Obtain NRC SER for uprate to 3014 MWt by the end of 2011.**

AREVA is committed to support Progress Energy.

❖ Letter of Intent Status

- ➢ Early issue resolution.
  - EFW Initiation time – 100% complete (CR3 can support 40 seconds)
  - EFW cavitating venturis performance – 40% complete
  - Boron precipitation feasibility – 50% complete
  - Containment volume and surface area (will take measurements this outage)
  - RW/SW/DC system design – Site review meeting 7/12/07
  - ADV sizing for Appendix R cooldown – 100% complete
  - DNB margin limits - complete and PSC for bayonet cracking (Scope removed, Calc review added - complete)
  - Secondary side blowdown for HPI pump/SBLOCA – 50% complete Fast Cooldown results below

Work has started in support of project goal

❖ Letter of Intent Status (continued)

- ➢ Project Management and schedule development on-going task.
- ➢ Thermal Hydraulics – New Operating Conditions in review, AIS, model development in progress.
- ➢ Safety Analysis – SG data acquisition, AIS, model development – SG data Issue & Restraint item added, AIS and model in progress.
- ➢ Fuel analysis – AIS, model development – Fuel Cycle Design and Operation – Phase A depletions – 60% complete.

Work has started in support of project goal

NSSS Proposal Status

- AREVA draft proposal wording provided – 3/23/07
- AREVA draft NSSS proposal provided – 4/23/07
- AREVA revised draft proposal provided – 6/20/07
- Contract award by 7/31/07

- AREVA – Incorporated CR-3 comments
  - Combine two proposals
  - Add NSSS ECs
    - Cavitating Venturi replacement
    - MSSV replacement
    - RCS code safety valve replacement
  - Add Feasibility Studies
    - Fast Cooldown System
    - Boron Precipitation
  - SW, RW, DC Review
  - Add HELB outside containment
  - Finalized affected calculations list
  - Mission Dose (not currently proposed as identified in Section 10.1.1 of proposal) estimated to be [redacted]

REDACTED

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PEF-NCR-00128

Issues and Restraints

Item #	Issue	Source	Applicable System or Document	Responsible Individual	Scheduled Completion Date	Actual Completion Date	Comments
1	Boron Precipitation	Initial design issue	NSSS	Esquillo			Needs selection and NRC approval
2	Fast Cooldown System - LPI Cross Connect	Initial design issue	NSSS	Esquillo			Needs to be designed. Manual or automatic. Will it perform its intended function?
3	RW, SW and DC approval by CR-3 Design and System Engineering	Initial design issue	RW, SW, DC	Stewart			CR-3 design organizations need to concur that the current design is acceptable.
4	Containment surface area and volume	Initial design issue	Containment	Esquillo			Need to take measurements in 2007 outage?
5	Building wall capability to withstand HELB outside containment	Initial design Issue	Intermediate building?	Worley Parsons			Current design has little margin.
6	Three Pump Operation Temp above 600F	Initial design issue	MS	Phase 1?			Three pump operation results in steam temperature in excess of 600F. Need to change pipe spec to allow temperatures over 600F or change Tave for three pump operation.
7	BWC Data	April 24 Mtg.	RCS	Progress / BWC			Need data / schedule for data.
8	Post Trip Turbine Header control setpoint.	N/A	NSSS /ICS	Seals			Need to make a decision on whether to keep +50 psi or reduce it.

POST-LOCA

BORIC ACID PRECIPITATION

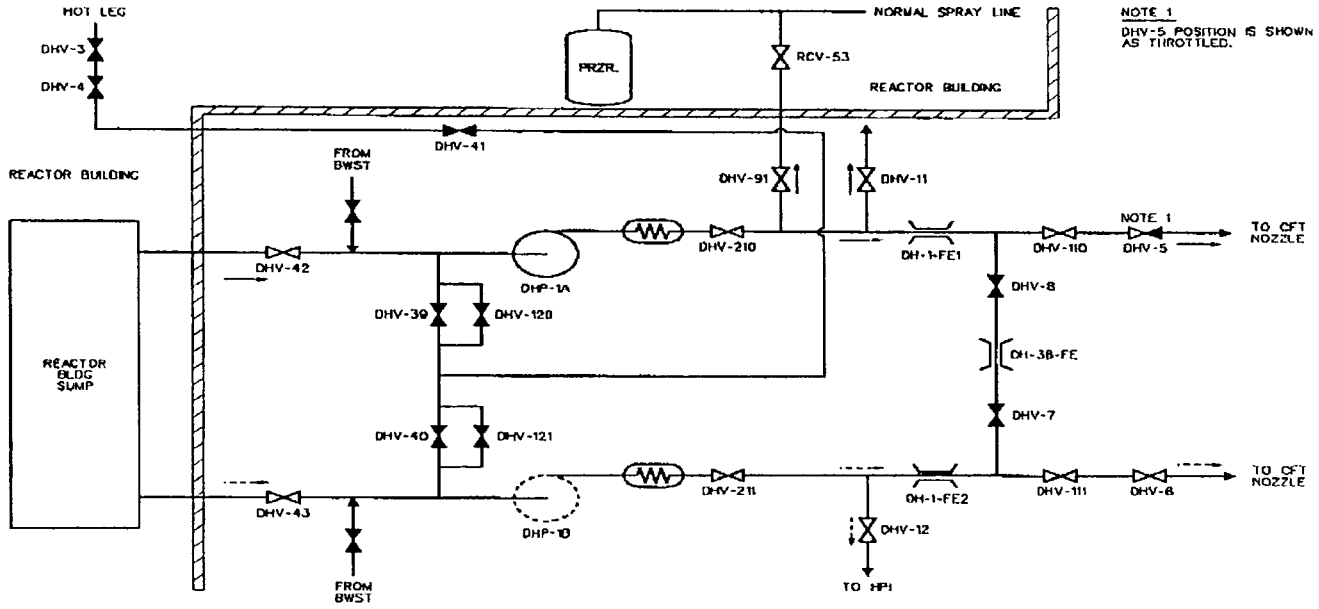
Post-LOCA Boric Acid Precipitation

- **Objective - Evaluate post-LOCA boric acid precipitation methods for use with the CR-3 EPU.**

- **Existing Options for Boric Acid Precipitation Control (EM-225B)**
  - **Auxiliary Pressurizer Spray (APS)**
  - **Dump to Sump (DTS)**

Boron Precipitation

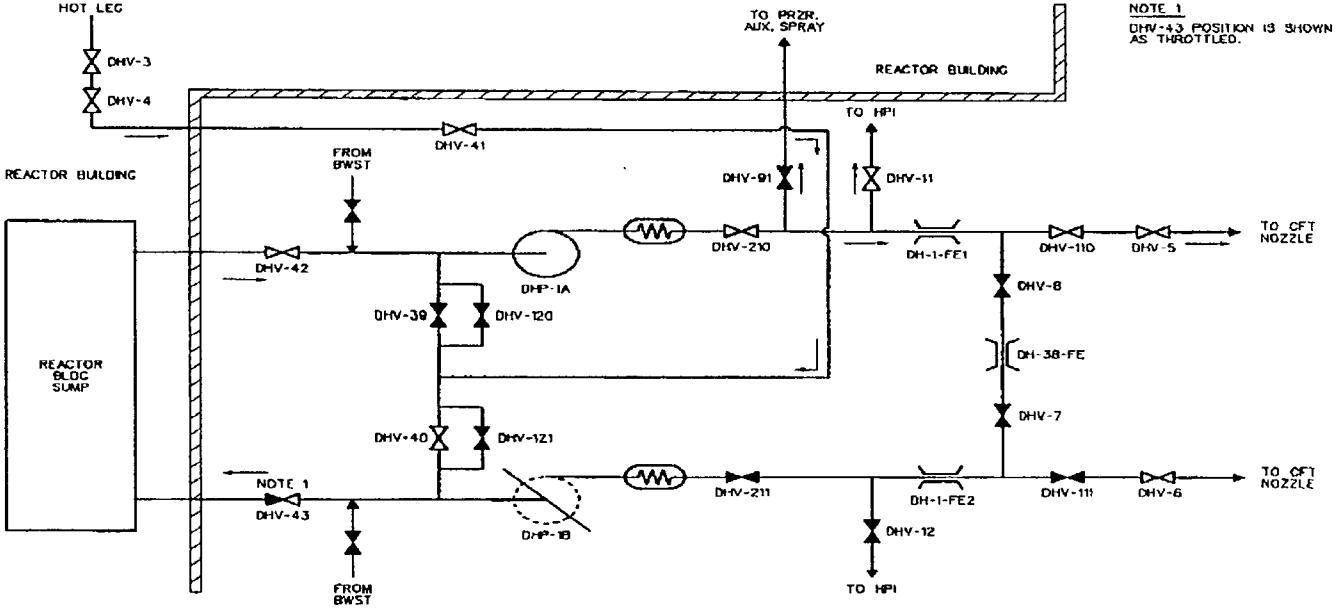
Auxiliary Pressurizer Spray Schematic



AUXILIARY PRESSURIZER SPRAY (APS) FLOW PATH

Post-LOCA Boric Acid Precipitation

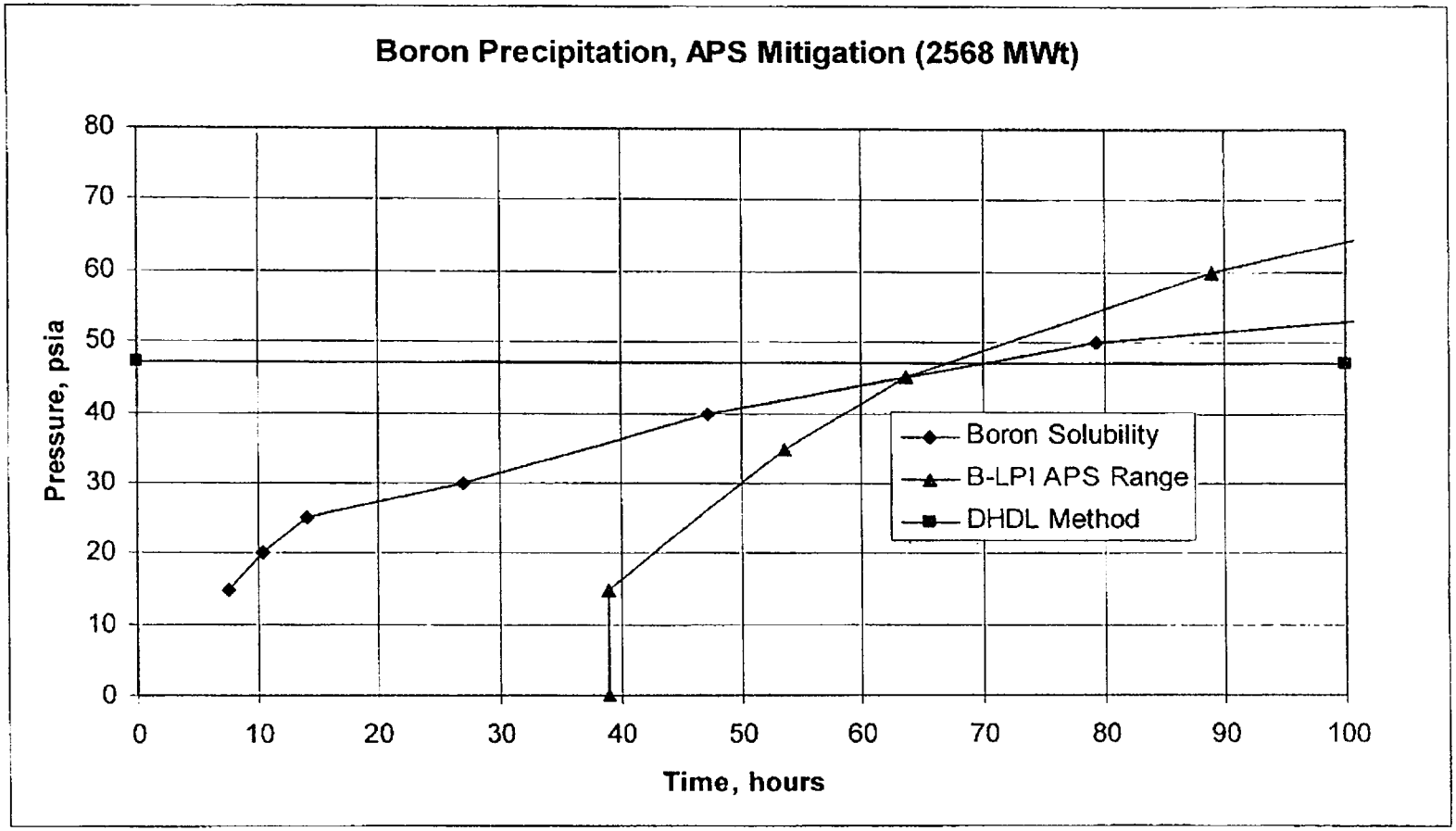
CR-3 Dump-to-Sump Arrangement with the A Train in Operation



DECAY HEAT DROP LINE TO SUMP (DTS) FLOW PATH

PEF-NCR-00133

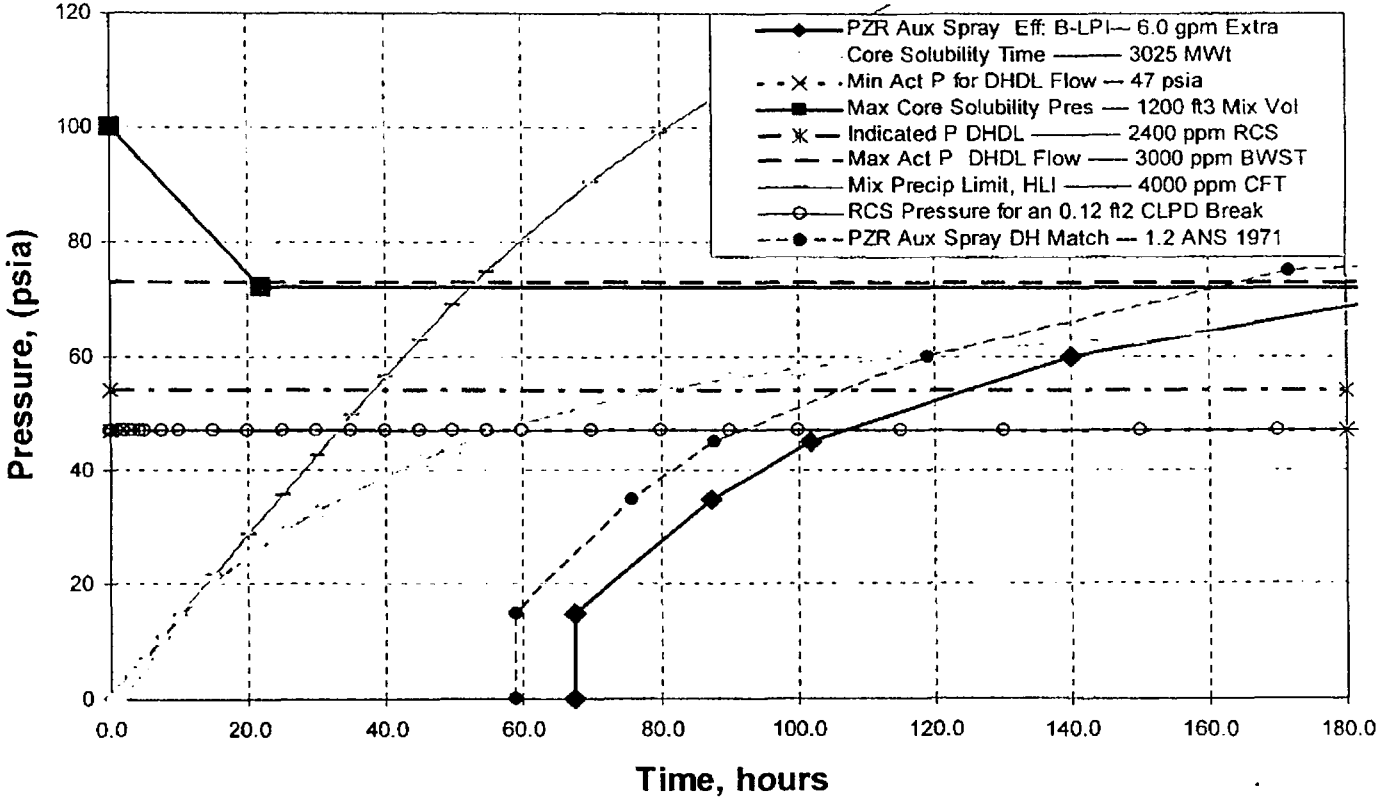
Post-LOCA Boric Acid Precipitation



Current arrangement has no margin for uprate

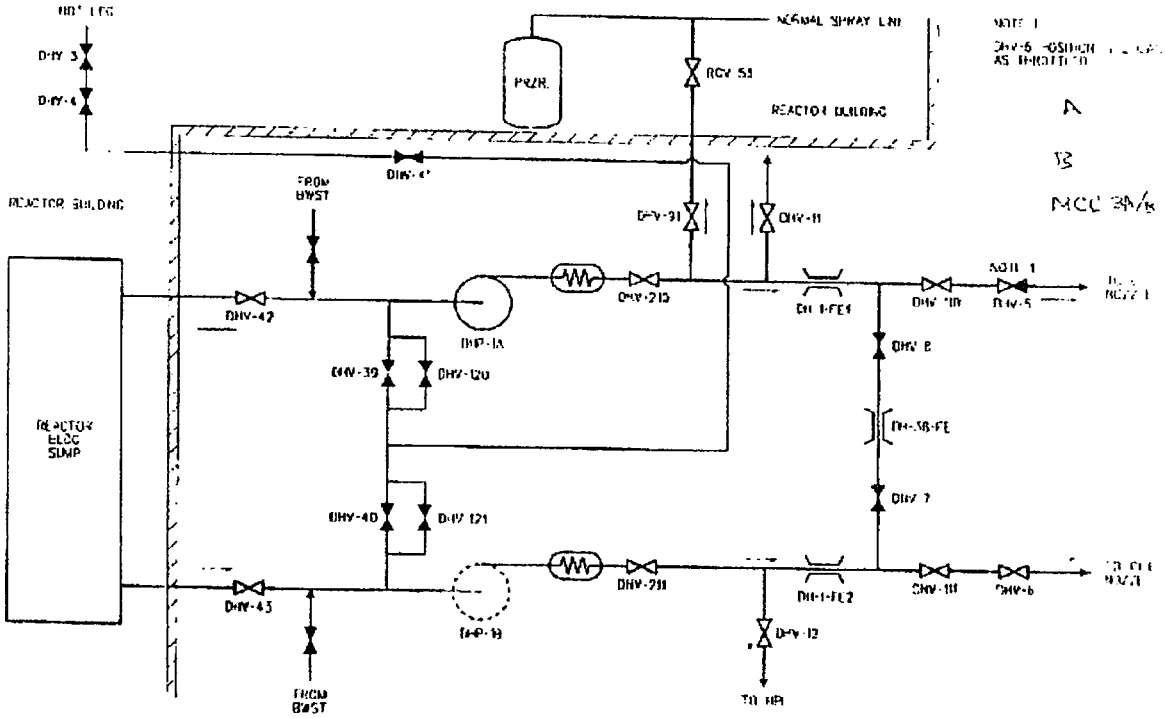
Post-LOCA Boric Acid Precipitation

Figure 3-4. Matchup Times and Time to Solubility Without Gap Flow or Active Boron Dilution.



Post-LOCA Boric Acid Precipitation

Existing Single Failure Issue with 10 CFR 50.46 Exemption



AUXILIARY PRESSURIZER SPRAY (APS) FLOW PATH

PEF-NCR-00136

Post-LOCA Boric Acid Precipitation

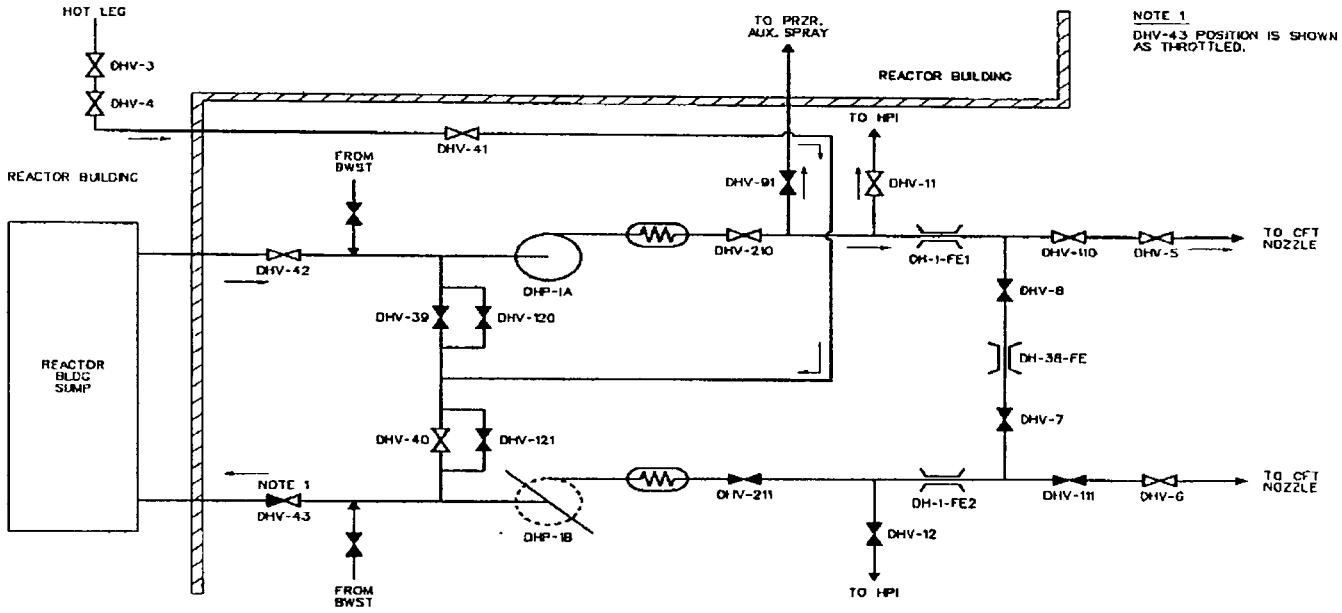
- **Evaluation Status**
  - **Prepared Draft Feasibility Study**
  - **Reviewed 11 options with plant personnel**
  - **Identified preferred options**

Post-LOCA Boric Acid Precipitation

- Options that do not meet single failure criterion
  - Preferred: Dump to Sump – Take credit for revised sump screen design
  - Backup: Hot Leg Injection from an operating LPI pump through an inactive LPI pump into the hot leg via the DHDL
- Options that meet single failure criterion
  - Preferred: Direct tie from each LPI pump discharge to drop line
  - Backup: Two additional (e.g. redundant) DHDL Bypass Lines

Post-LOCA Boric Acid Precipitation

CR-3 Dump-to-Sump Arrangement with the A Train in Operation

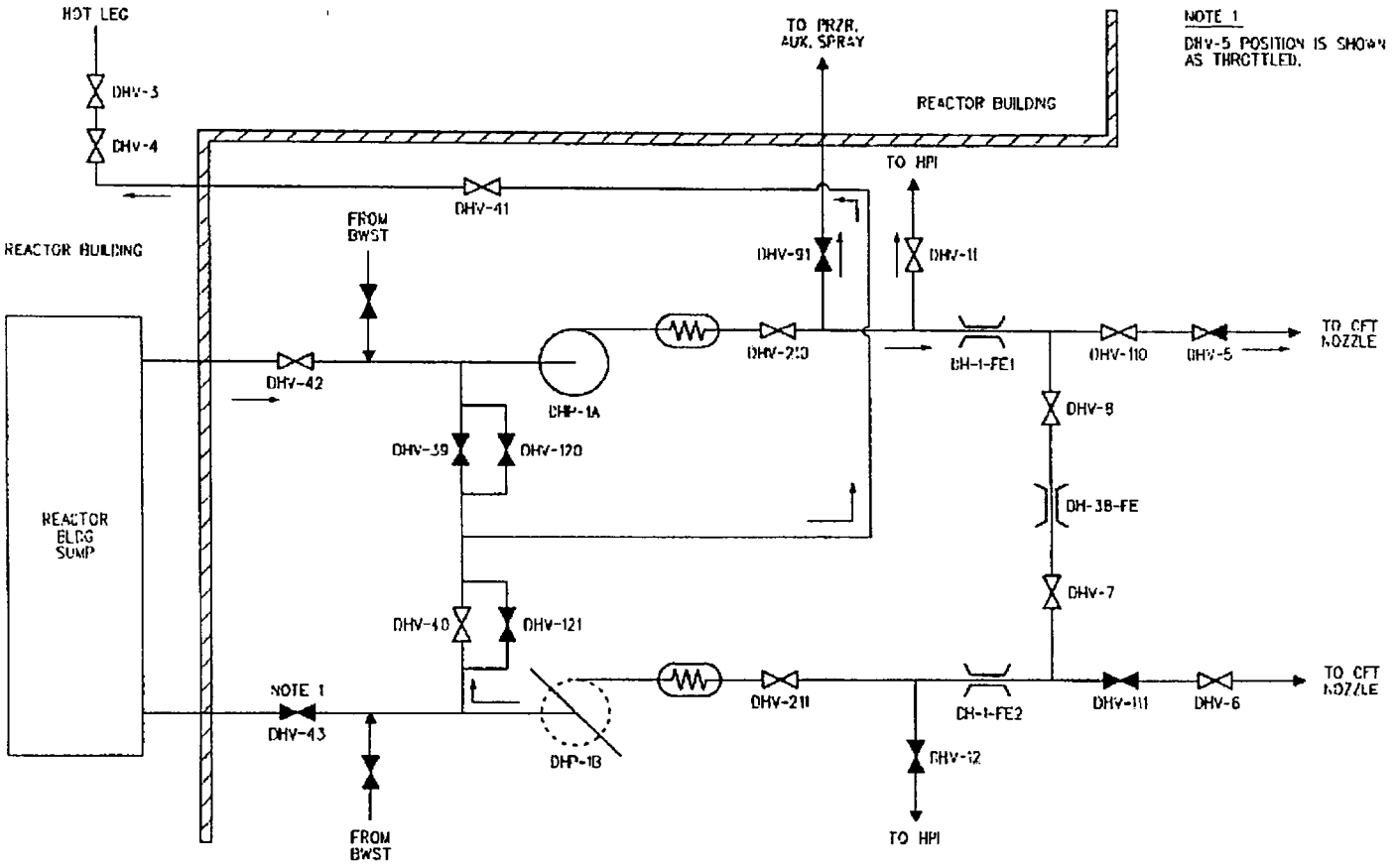


DECAY HEAT DROP LINE TO SUMP (DTS) FLOW PATH

PEF-NCR-00139

Post-LOCA Boric Acid Precipitation

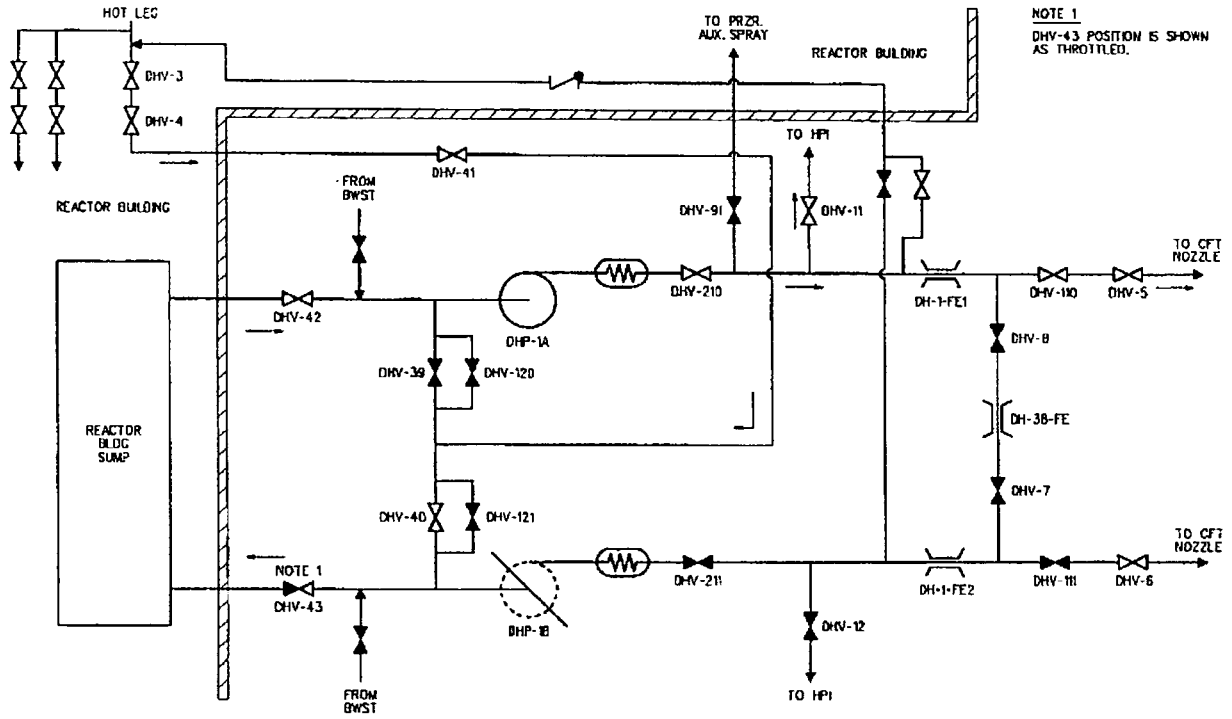
Existing Hot Leg Injection Via Train A LPI Pump Using the DHDL Back Flow through a Deactivated LPI Pump



PEF-NCR-00140

Post-LOCA Boric Acid Precipitation

Two Redundant DH Drop Line Bypass Lines



SINGLE FAILURE PROOF BORON PRECIPITATION CONTROL OPTIONS

AREVA

Post-LOCA Boric Acid Precipitation

SUMMARY / ACTIONS

- Options for boric acid precipitation mitigation defined
- Need to verify acceptability of dump to sump option
- Need to begin NRC discussions

PEF-NCR-00142

FAST COOLDOWN

AREVA

Fast Cooldown

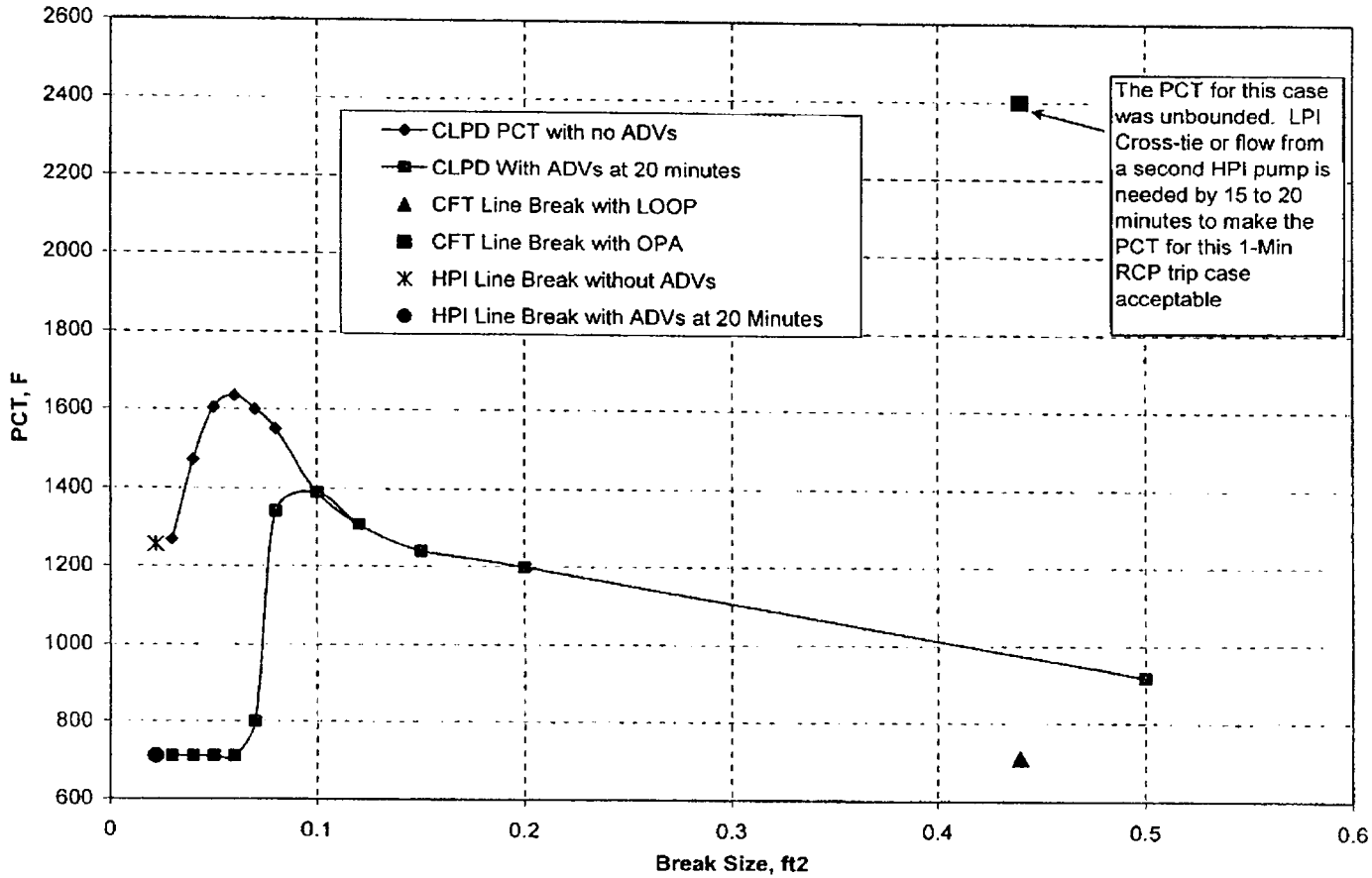
- **Feasibility study identifies HPI pumps and motors need to be increased in size (i.e., impact on EDG) to mitigate PCT for SBLOCA**
- **A potential alternative is safety grade ADVs in MS lines**
- **Evaluation performed to determine if fast cooldown system could preclude replacing HPI pumps and motors**

Fast Cooldown

- **Evaluation Status**
  - **Draft 12-document prepared**
  - **Site review meeting held**
  - **Preliminary options defined**

Fast Cooldown

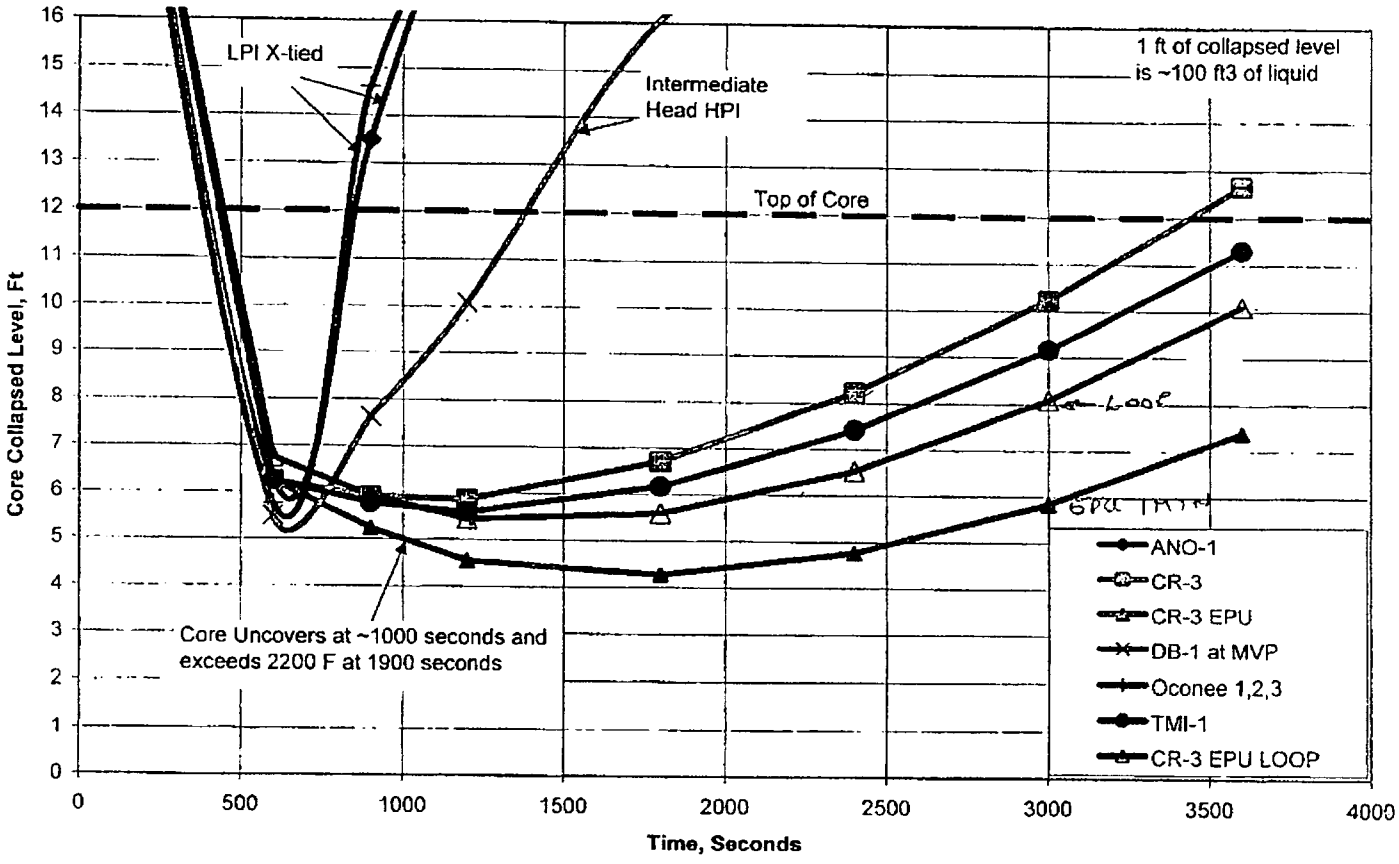
Figure 5. Preliminary CR-3 EPU SBLOCA PCT Versus Break Size



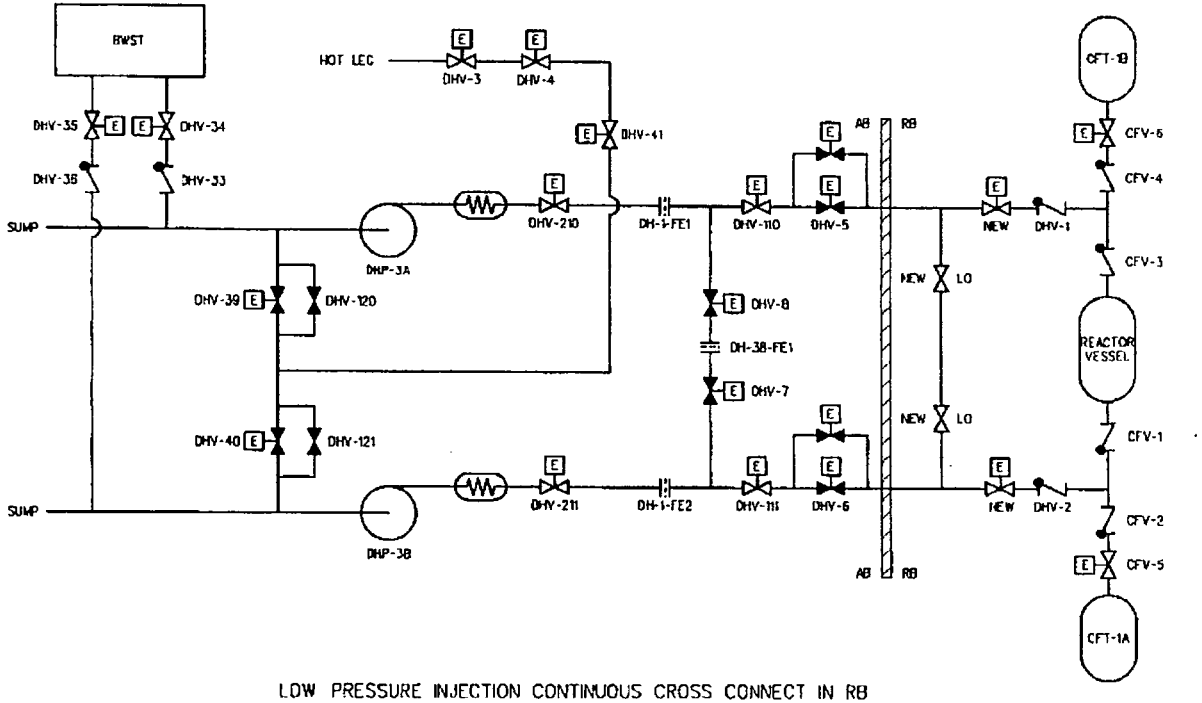
PEF-NCR-00146

Fast Cooldown

Figure 1. Representative Core Collapsed Liquid Levels Versus Time fow a Delayed RCP Trip with a CFT Line Break



LPI Cross Connect



LOW PRESSURE INJECTION CONTINUOUS CROSS CONNECT IN RB

PEF-NCR-00148

AREVA

Fast Cooldown

- **Atmospheric Dump Valves (ADVs)**
  - **5% flow capacity each**
  - **Analysis assumes one ADV per steam generator**
  - **EC would include one 5% ADV per steam line (4 ADVs)**
    - **One A powered and one B powered from each SG**
    - **Adds capability for loss of an ADV**

PEF-NCR-00149

Fast Cooldown

- Evaluation Results
  - Neither automatic ADV on LSCM or manual ADV opening at 20 minutes prevent PCT >2200°F for CFT line break with offsite power available.
  - Additional flow to the core from HPI flow or LPI Cross Connect is needed to mitigate CFT line break and provide abundant core cooling.
  - Manual opening of ADVs prevents core heatup for HPI line break and all SBLOCAs that heatup after 20 minutes, reduce PCT to 1400°F for all SBLOCAs (except CFT line break). Manual operation provides margin to address NRC concern with breakaway cladding oxidation.
  - Automatic initiation of ADVs can reduce PCT for some of the breaks that reach PCT within 20 minutes but will not substantially improve the PCT for the largest SBLOCAs.

Fast Cooldown

- Issues to be resolved
  - Choose option for mitigation of core flood line break
  - Two or Four ADVs
  - Manual Actuation of ADVs
  - ADV Interaction with ICS, EFIC, overpressure control.

AREVA

Containment Volume and Surface Area

- Developing Task Plan – Including walkdown for 2007 outage.
- 50% of data for volume and surface area available from existing Metrology and AutoCAD models.
- Identifying what needs to be scanned in R15 outage.
- We need to coordinate with outage planning to obtain required data.

AREVA

BWC Data

- AREVA needs clarification of what is happening with BWC SG data. Based on the April 24, 2007 meeting with BWC, AREVA was assured all identified data would be available within five or six months.

BOP Phase 1 Proposal

- **Minimizing interface issues will be critical to meeting schedule (BWC data).**
- **Schedule for some evaluations like SC system, and other specifications are extremely short.**
- **There is no resource loading or learning curve time available.**
- **One company for both the BOP and NSSS will reduce Progress Energy management costs and headaches.**

AREVA believes only the AREVA NP and WorleyParsons team can possibly come close to the schedule.

PEF-NCR-00154

ENVIRONMENTAL

- SITE CERTIFICATION SUBMITTED
- PROJECT PLAN DRAFTED
- THERMAL (BTU AND FLOW) MITIGATION STUDIES SCOPED OUT AND SOME ASPECTS UNDERWAY

EXTENDED POWER UPRATE

- TURBINE-GENERATOR VENDOR SELECTED
- BOP EVALUATION COMPLETE. REV PENDING TO ADDRESS SOME EXCESS CONSERVATISMS
- PROJECT PLAN BEING FINALIZED
- REQUEST FOR PROPOSALS OUT FOR BOP WORK

BOP Phase 1 Evaluations

PEF-NCR-00157

BOP Phase 1 Evaluations

- **PURPOSE**

Produce a consolidated scoping document for Crystal River to be used as the technical basis for soliciting competitive bids for the BOP Phase 1 detailed design.

BOP Phase 1 Evaluations

❖ STATUS

- ➢ Rev. 0 Completed: 05/21/2007
- ➢ RW, SW, DC Meeting Results
- ➢ Aux Transformer

Auxiliary Transformer

- Feedwater Booster Pump motor increase
  - From 2500HP to 4000HP
  - Identified in the Phase 1 Design Evaluation Study Expert Panel review as a least cost option vs. increasing the turbine driven feed water pump.
- These design changes will required additional Load of ~ 1500HP
  - 2.2MVA to each switchgear bus MTSW-2A and 2B
  - Consequently, will impact the existing non-safety power system and equipment such as over loading the 4KV winding of the transformer.
- Recommended Solution
  - Re-distribute loads on different buses (i.e. 6 kV bus)

Summary/Wrap up

AREVA

Summary/Wrap-Up

- MUR submittal accepted by NRC awaiting RAIs
- BOP Phase 1 Evaluation complete preparing proposal
- NSSS LOI extended 30 days
- NSSS Proposal in negotiation
- EPU project is proceeding as planned. BWC data issue impact is yet to be determined.
- Next Meeting – Mid August

AREVA

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AGENDA

CR3 MUR
EXECUTIVE MEETING
12-08-06

Project Status

- Schedule Overview
- Draft Deliverable Status
- Action Items
- Issues and Restraints
- Key Issues
  - RPS High Flux Trip Setpoint
  - Heat Balance Uncertainty Calculation
  - FIDMS vs Tricon

Proposal Status

- Overall Status
- Metrics
- Payment Plan

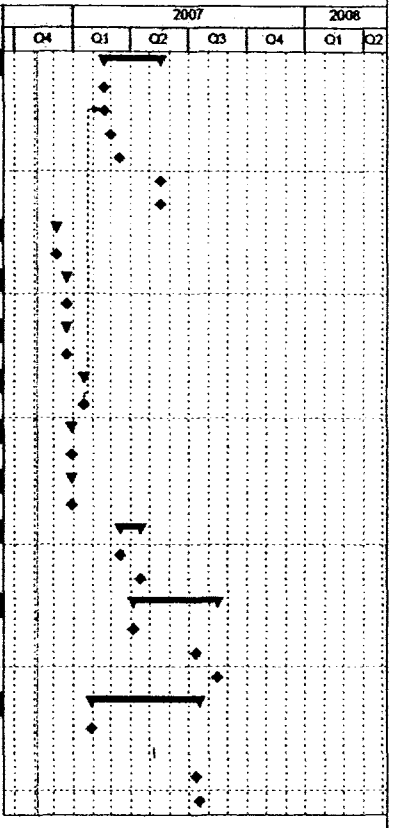
Summary

Project Status

Schedule Overview

MUR MILESTONE SCHEDULE — 06-Dec-06 17:17

Activity ID	Activity Name	RD	ES	EF	Total Float	CR3 Date	RESP
CRLAR126	Issue TS and FSAR Changes to CR3	0d		19-Feb-07*	0d	19-Feb-07	SCOTT
CRLAR129	Submit LAR to CR3	0d		19-Feb-07*	7d	26-Feb-07	SCOTT
CRLAR034	Transmit LOCA M&E to CR3 for Review	0d		01-Mar-07*	0d	01-Mar-07	SCOTT
CRLAR036	Issue Final LOCA M&E to CR3	0d		15-Mar-07*	0d	15-Mar-07	SCOTT
CRCPM011	Transmit Calculation Package Modifications to...	0d		18-May-07*	19d	15-Jun-07	ESQUILLO
CRPM001	Transmit Procedure Modifications to CR3	0d		18-May-07*	30d	29-Jun-07	CR3
NSSS I&C Systems							
CRSEIC060	Transmit to Progress Energy for Comments	0d		07-Dec-06*	0d	07-Dec-06	CHEATHAM
BOP Electrical Systems							
CRSEBE160	Transmit to Progress Energy for Comments	0d		21-Dec-06*	0d	21-Dec-06	BRUCE
NSSS Fluid Systems							
CRNFS180	Transmit to Progress Energy for Comments	0d		22-Dec-06*	0d	22-Dec-06	ESQUILLO
NSSS Structural Analysis							
CRNSA270	Transmit to Progress Energy for Comments	0d		18-Jan-07*	8d	19-Jan-07	SCOTT
BOP Fluid Systems							
CRBFS260	Transmit to Progress Energy for Comments	0d		29-Dec-06*	0d	29-Dec-06	STEWART
HVAC Systems							
CRHV120	Transmit to Progress Energy for Comments	0d		29-Dec-06*	20d	26-Jan-07	STEWART
Thermal-Hydraulics (T-H) Models/Operating Conditions							
CRTH031	Transmit Heat Balance Uncertainty Calc to CR3	0d		16-Mar-07*	0d	16-Mar-07	DEVENDORF
CRTH061	Transmit Simulator Inputs to CR3	0d		17-Apr-07*	8d	27-Apr-07	CLAUNCH
Fuel America							
CRFANAS031	FIDMS Version 1.8 Installed at CR3	0d		05-Apr-07*	0d	05-Apr-07	CREASY
CRFARL006	Transmit Draft Reload Report to CR3 for Review	0d		13-Jul-07*	0d	13-Jul-07	SUHOCKI
CRFARL011	Issue Final Reload Report to CR3	0d		15-Aug-07*	0d	15-Aug-07	SUHOCKI
AREVA Prepare Engineering Change Package							
CRECP110	Issue 30% Design Challenge	0d		31-Jan-07*	0d	31-Jan-07	DEVENDORF
CRECP125	CR3 Confirm for 70% Design Challenge	0d	09-May-07	09-May-07*	1d	10-May-07	DEVENDORF
CRECP099	Issue 100% Design Challenge	0d		12-Jul-07*	8d	24-Jul-07	DEVENDORF
CRECP100	Issue Caldon EC to Crystal River	0d		19-Jul-07*	8d	31-Jul-07	DEVENDORF



Actual Work · Remaining Work · Critical Remaining Work · Summary · Milestone

Page 1 of 1

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Draft Deliverable Status

Deliverable	Due Date	Draft Date	CR3 Review Date
New Operating Conditions	**11/13/06**	**11/13/06**	**12/08/06**
Updated PEPSE	**11/22/06**	**11/29/06**	**12/08/06**
NSSS I&C System Evaluation	**12/1/06**	**12/01/06**	**12/15/06**
EC's Closed Since 2002	**12/6/06**	**12/6/06**	**12/20/06**
Electrical System Evaluations	12/21/06		
NSSS Fluid System Evaluation	12/22/06		
BOP Fluid Systems Evaluation	12/29/06		
HVAC Systems Evaluation	12/29/06		
NSSS Structural Evaluation	1/19/07		

Action Items - Handout

Key Issues

RPS High Flux Trip Setpoint – Davis-Besse Issue

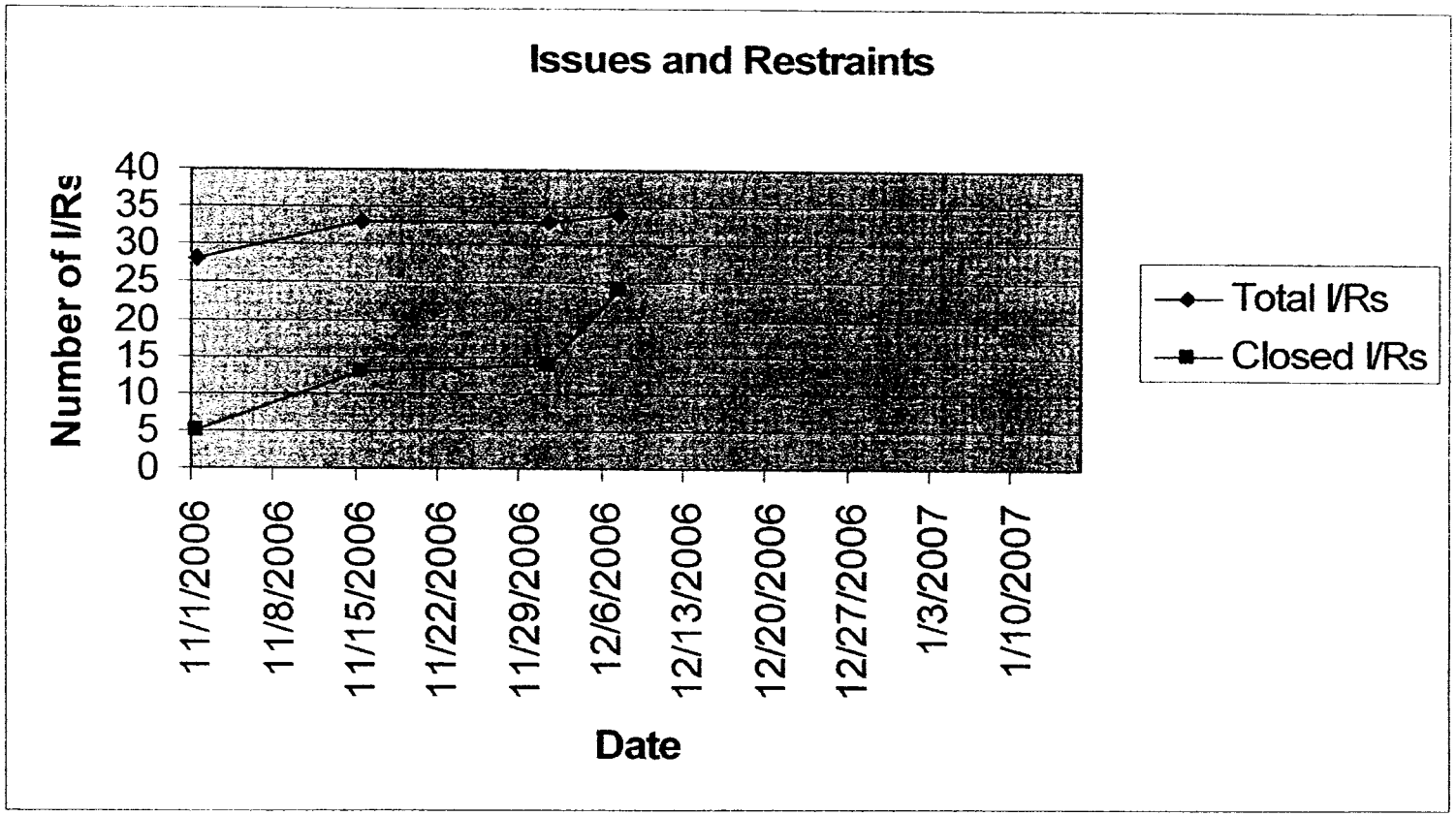
1. **Operate at current trip setpoint of 104.9%. Have an LCO to reduce setpoint to 103.3% and reduce core power to 98.4% on loss of LEFM.**
2. **Operate all the time at a reduced setpoint of 103.3% and reduce core power to 98.4% on loss of LEFM.**
3. **Operate at higher setpoint all the time, but have LCO to recalibrate NIs to 2568 MWt = 100% on loss of LEFM.**

Recommend we proceed with first option.

Heat Balance Uncertainty Calculation

- Initial Heat Balance uncertainty input calculation schedule does not support LAR submittal date.
  - Need input uncertainty calculations
    - MS Temp, MS Press, FW Temp, FW Press, LD Flow, MU Flow, MU Temp, RCS Tcold
- **Schedule to be resolved by 01/04/07.**

Issues and Restraints Status



PEF-NCR-00170

Key Issues

Symbol	Description	Units	Preparer	Draft Calc Date	Reviewer	Complete Internal Review	CR3 Review Complete	Final Doc Sign Off	Comments
WFW	Feedwater Flow Rate	lbm/hr	Caldon						
TS	Steam Temperature	F	Wagner	3/15/07					
PS	Steam Pressure	psia	Wagner	2/04/07					
TFW	Feedwater Temperature	F	Caldon						
PFW	Feedwater Pressure	psia	Wagner	12/22/06					
WMU	Makeup Flow Rate	lbm/hr							
TMU	Makeup Temperature	F							
PMU	Makeup Pressure	psia							
WLD	Letdown Flow Rate	lbm/hr							
TLD	Cold Leg Temperature	F							
PLD	Letdown Pressure	psia							
QRCP	RCP Power	Btu/hr	Weimer						Included in Uncertainty Calc
QLOSS	Ambient Heat Loss	Btu/hr	Weimer?						
	Heat Balance Uncertainty Calc		Weimer						

Issues and Restraints Status

Item #	Issue	Source	Applicable System or Document	Responsible Individual	Scheduled Completion Date	Actual Completion Date	Comments
1	Turbine Lube Oil Temperature	SE01-0154 I/R #1	SC	N/A	N/A	10/20/2006	**Resolved:** Cleaned Lube oil cooler
2	Hydrogen Cooler Temperature	SE01-0154 I/R #2		N/A	N/A		**Resolved:** Simultaneously with I/R 14
3	Iso-Phase Bus Duct Humidity	SE01-0154 I/R #3					**Resolved:** Humidity sensor replaced. Not an MUR issue.
4	Condenser	SE01-0154 I/R #4	CD	Ted Williams	N/A	12/6/2006	Resolved: Condenser dT is 25F. Will need to reduce to approximately 85%RTP and monitor dT across water box
5	CDHE-1/2/3 Above Design Parameters	SE01-0154 I/R #5				11/15/2006	**Resolved:** EC 49524
6	FWHE-2/3 Above Design Parameters	SE01-0154 I/R #6				11/15/2006	**Resolved:** EC 49524
7	Condensate Demineralizers Above Design Flow	SE01-0154 I/R #7				11/14/2006	**Resolved:** DBD was changed to reflect 2619.4 MWt flows.
8	PEPSE Model Secondary Plant Performance Evaluation	SE01-0154 I/R #8	All	Steve Claunch		11/2/2006	**Resolved:** Scientech upgraded model in 2002

Issues and Restraints Status

Item #	Issue	Source	Applicable System or Document	Responsible Individual	Scheduled Completion Date	Actual Completion Date	Comments
9	Step-up Transformer Loading	SE01-0154 I/R 9		N/A	10/31/2006	11/1/2006	**Resolved:** EC-64327
10	RCP Load Transfer	SE01-0154 I/R 10		N/A		9/13/2006	**Resolved:** EC-61858 RCPs restored to Unit Aux Bus
11	BAST Volume	SE01-0154 I/R 11		Virg Esquillo	1/26/2006		
12	HDVs Above Design Pressure/Flow	SE01-0154 I/R 12		Don Ryan	1/15/2006		
13	Discharge Temperature Increase	SE01-0154 I/R 13				10/23/2006	**Resolved:** Helper cooling towers
14	SC System Performance	SE01-0154 I/R 14				11/15/2006	**Resolved:** Nitrogen injection is not MUR related issue.
15	ICS EC - Who will do this	System Interviews	IC	Ted Williams		11/9/2006	**Resolved:** PE will do EC for TRICON and AREVA will do ICS.
16	Main Steam Thermowell/ Jet Impingement Shield	Initial Walkdown	NNI	G. Hildebrandt	completed	12/6/2006	Resolved: EC 65629 will locate RTD in accessible location
17	HELB Analysis Outside Containment	System Interviews	HELB Program	Scott/Williams	In Progress		Define Responsibility
18	FIDMS installation in summer - fall 2007	Discussions Lynchburg and Raleigh Fuels	Plant computer	Larry Creasy		11/1/2006	**Resolved:** FIDMS 1.8 to be installed in the spring 2007.

Issues and Restraints Status

Item #	Issue	Source	Applicable System or Document	Responsible Individual	Scheduled Completion Date	Actual Completion Date	Comments
19	Fuel Schedule does not support Nov. 2007 SER	Fuel Discussions	COLR	Creasy/Morgan	10/31/2006	11/15/2006	**Resolved:** AREVA Fuels will work to an agreed upon revised schedule.
20	Early LAR Submittal	Progress Energy Licensing Recommendation	LAR	Kane/Wilson	11/17/2006	Complete	**Resolved:** Level I schedule developed that shows Mid May submittal date. Earlier date will be dependent upon accelerated reviews of one week instead of two which may reduce submittal date to End of April.
21	Appendix R analysis performed at 2568 MWt	System Interviews	Appendix R	Scott/Seals		Complete	**Resolved:** AREVA to perform scoping evaluation to ensure 72 hour comp time met
22	FAC analysis limiting at feedwater to fdw. Ring header	System Interviews	FAC/ FW	Scott		Complete	**Resolved:** AREVA performing FAC analysis. Identified in Level I schedule
23	Heat Balance Pump Heat	General Discussions	CTP	Weimer		Complete	**Resolved:** 21MWth will be used in HB uncertainty analysis based on BHP.
24	Progress Energy Support Team	N/A	N/A	D. Roderick	11/20/2006	11/6/2006	**Resolved:** Ted Williams is PM
25	Verify Progress Energy will do installation	General Discussions	ECs	D. Roderick	10/16/2006	10/16/2006	**Resolved:** PE will install
26	Seismic Qualification of Caldon Equipment	PO Review	Caldon PO	B. Devendorf	10/29/2006	10/19/2006	**Resolved:** Equipment will be qualified
27	Review and Approval Process for Documents	General Discussions	All Documents	Ken Wilson	1/15/2006	12/6/2006	**Resolved:** AREVA provides mark ups and final AREVA docs. CR# performs Owner acceptance reviews and records submittal

Issues and Restraints Status

Item #	Issue	Source	Applicable System or Document	Responsible Individual	Scheduled Completion Date	Actual Completion Date	Comments
28	T/G Governor Valve Programming Curve	System Interviews	TG				Modify if required
29	Condensate Pump Resonate Speed	System Interviews		Don Ryan	12/12/2006		
30	Feedwater Start-up valve stroke margin	System Interviews		Don Ryan	12/12/2006		
31	Condenser backpressure not evaluated in 2001	System Interviews		Don Ryan	12/12/2006		
32	ADV and TBV Margin Acceptability	System Interviews		Don Ryan	12/12/2006		
33	RPS High Flux Trip - How to handle	Davis Besse	RPS	Wilson	12/8/2006		Choose Path
34	H. B. Uncertainty and Daughter Calc Schedule	Schedule Dev.	HB Calc	Bondurant	1/4/2007		Add resources and resolve schedule issues

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Project Status

Overall Status REDACTED

- Approximately [redacted] T&M effort will be billed for 2006.
- System Evaluations are approximately 75% complete.
- Fuels is approximately 70% complete for LAR.
- EC's are approximately 20% complete.
- Schedule is being met.

Proposal Summary

Work Scope Defined

Schedule Defined

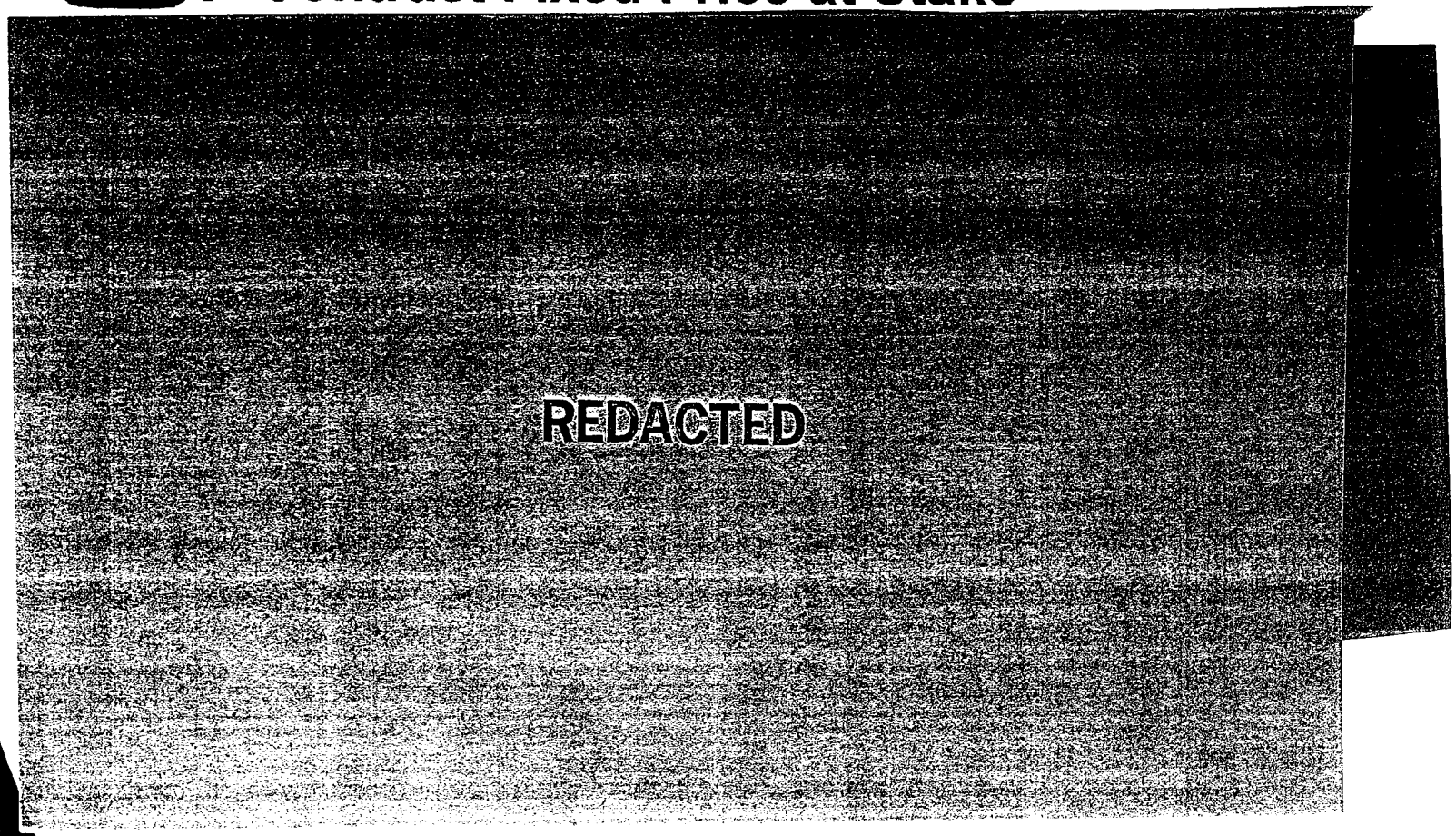
Deliverables Defined

Metrics Defined

Payment Schedule Defined

Proposal Presented to CR3

- AREVA to Share Risks With CR3
- [redacted] of Contract Fixed Price at Stake



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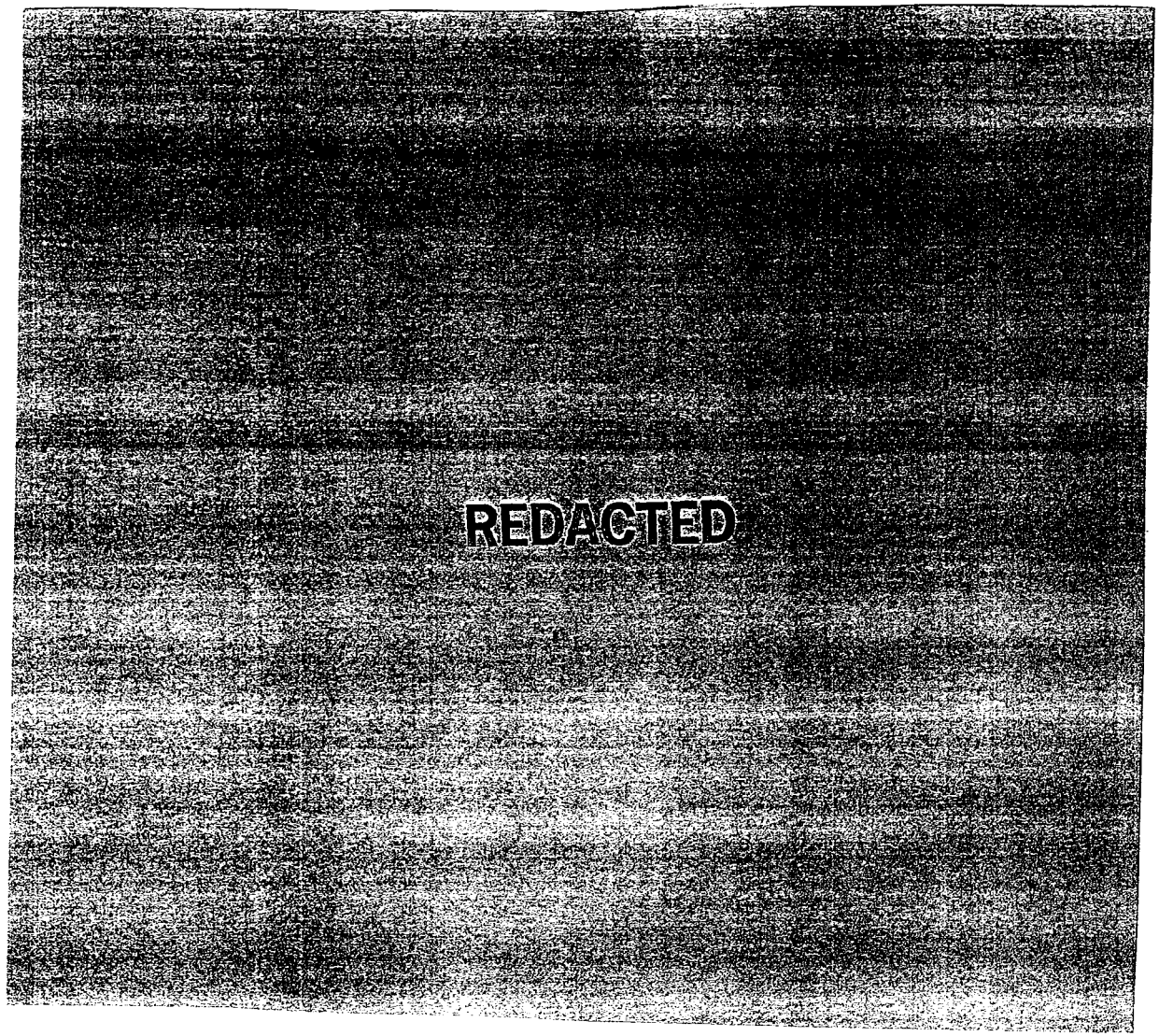

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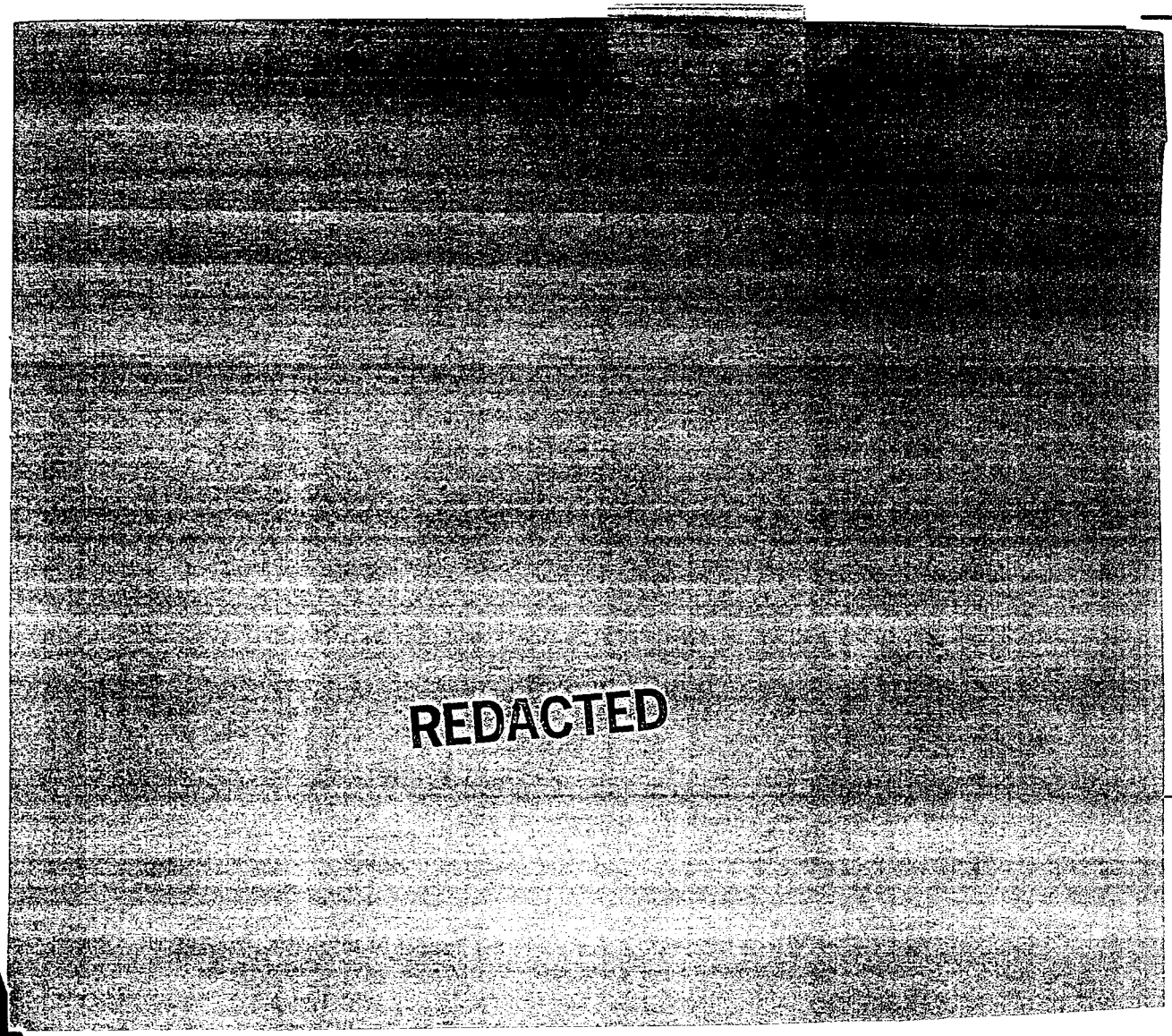

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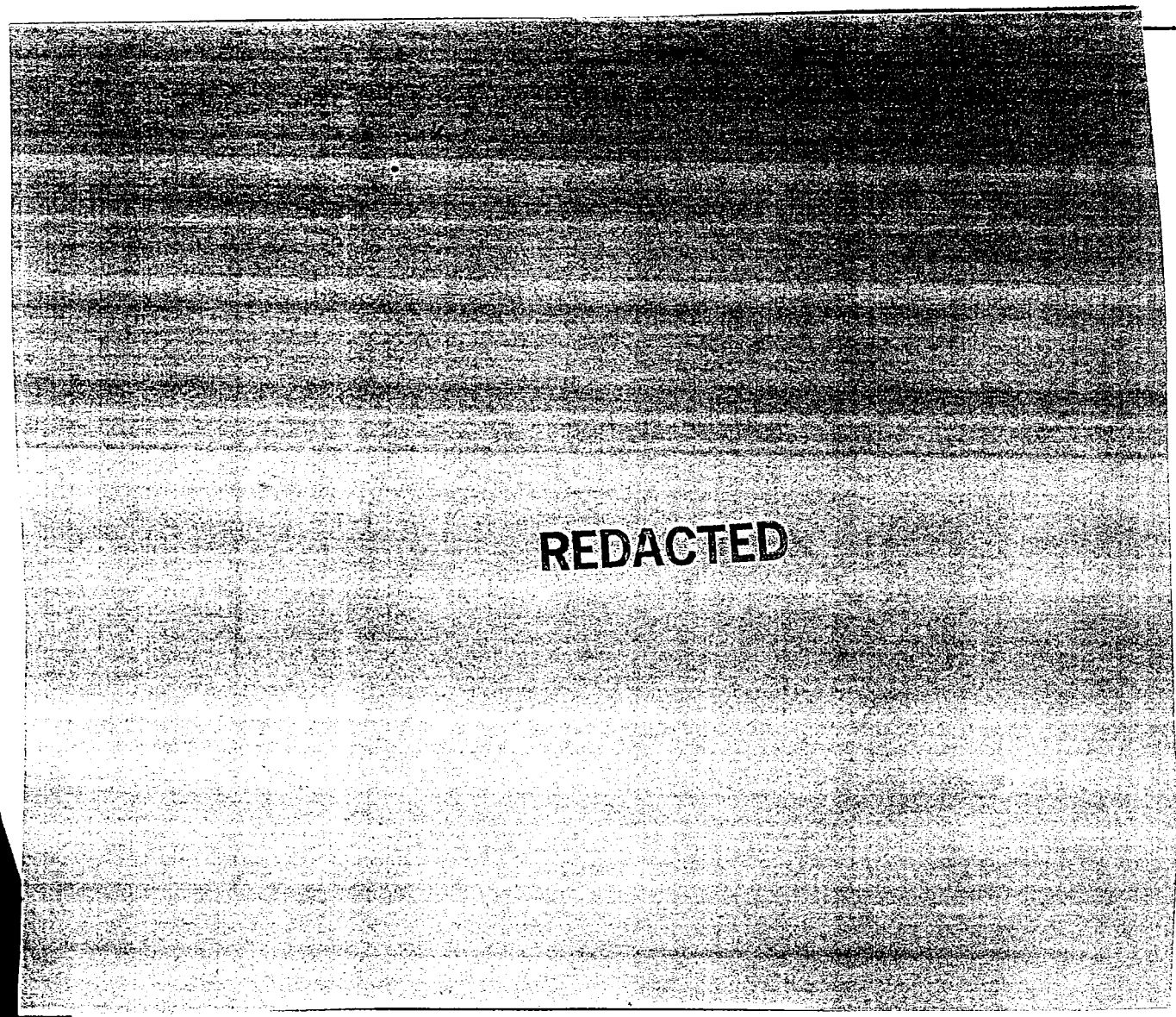

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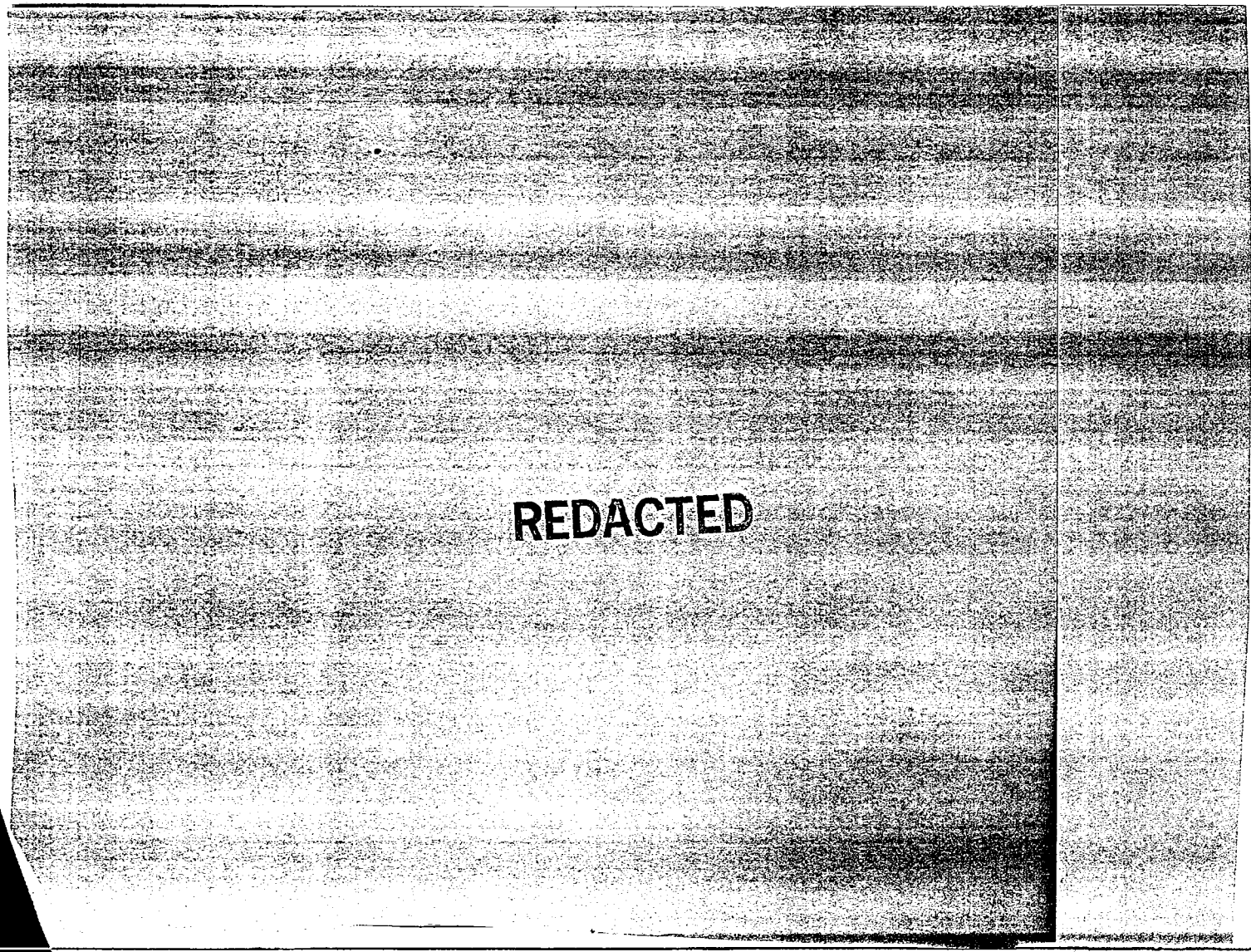
Metrics



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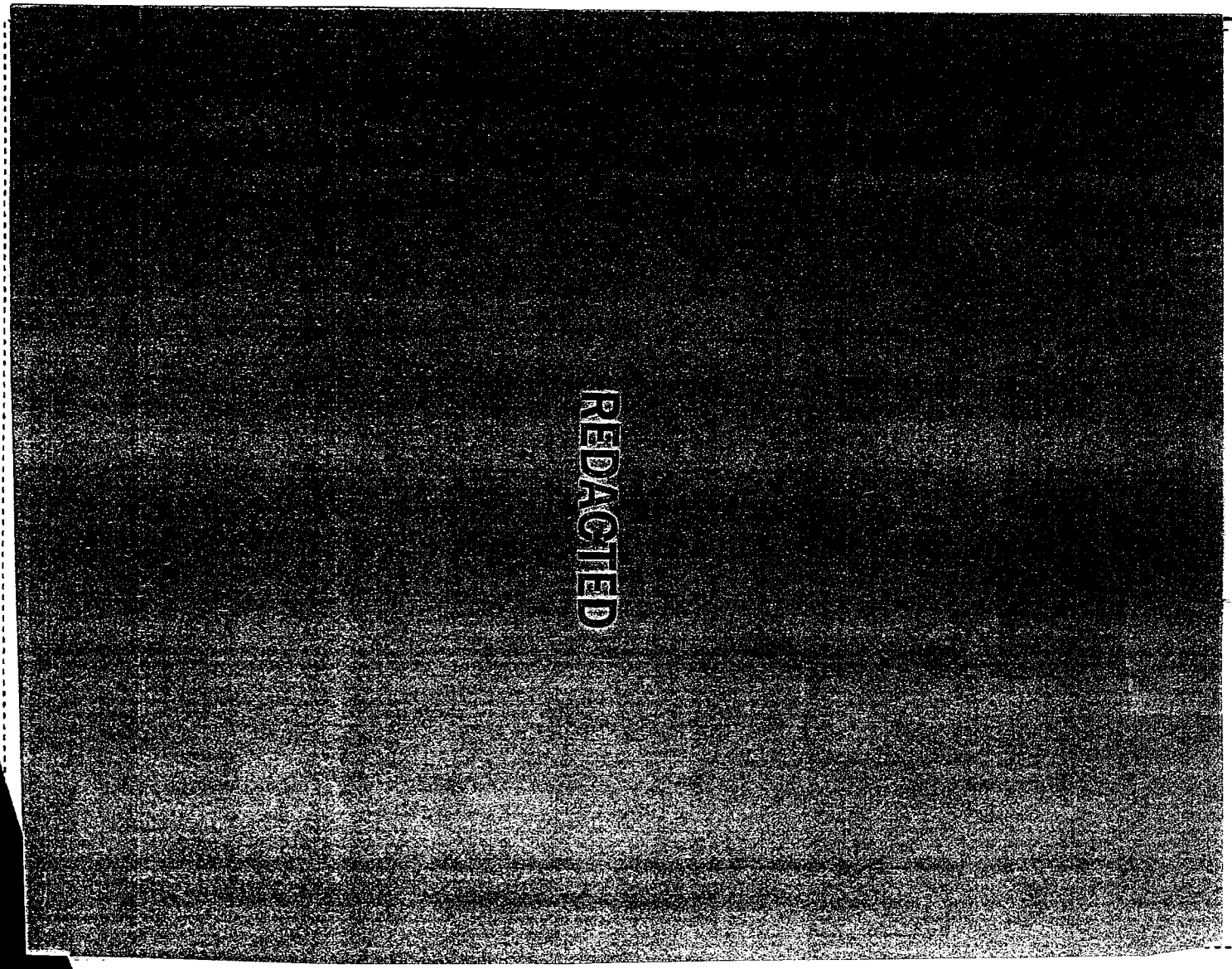

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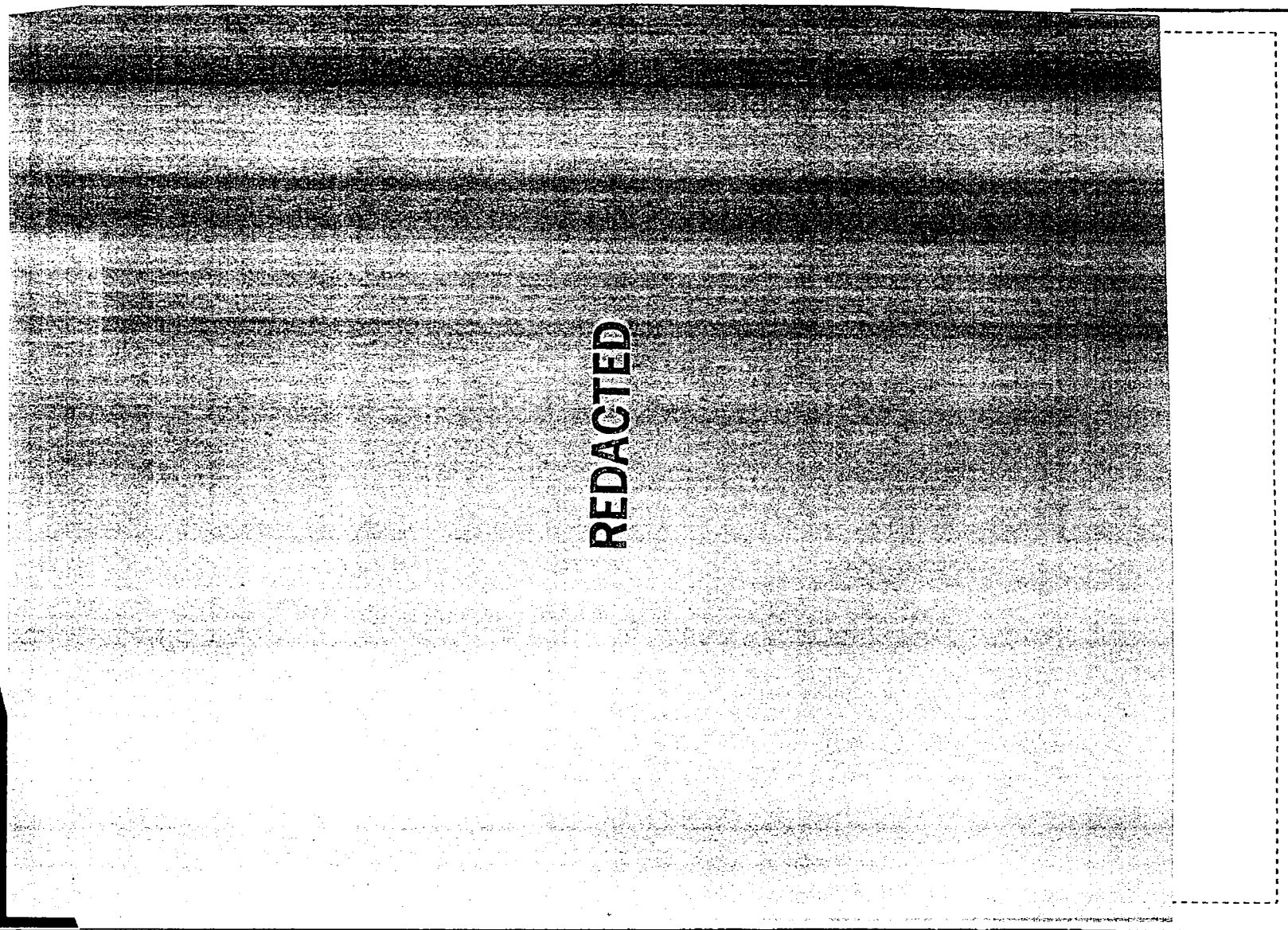
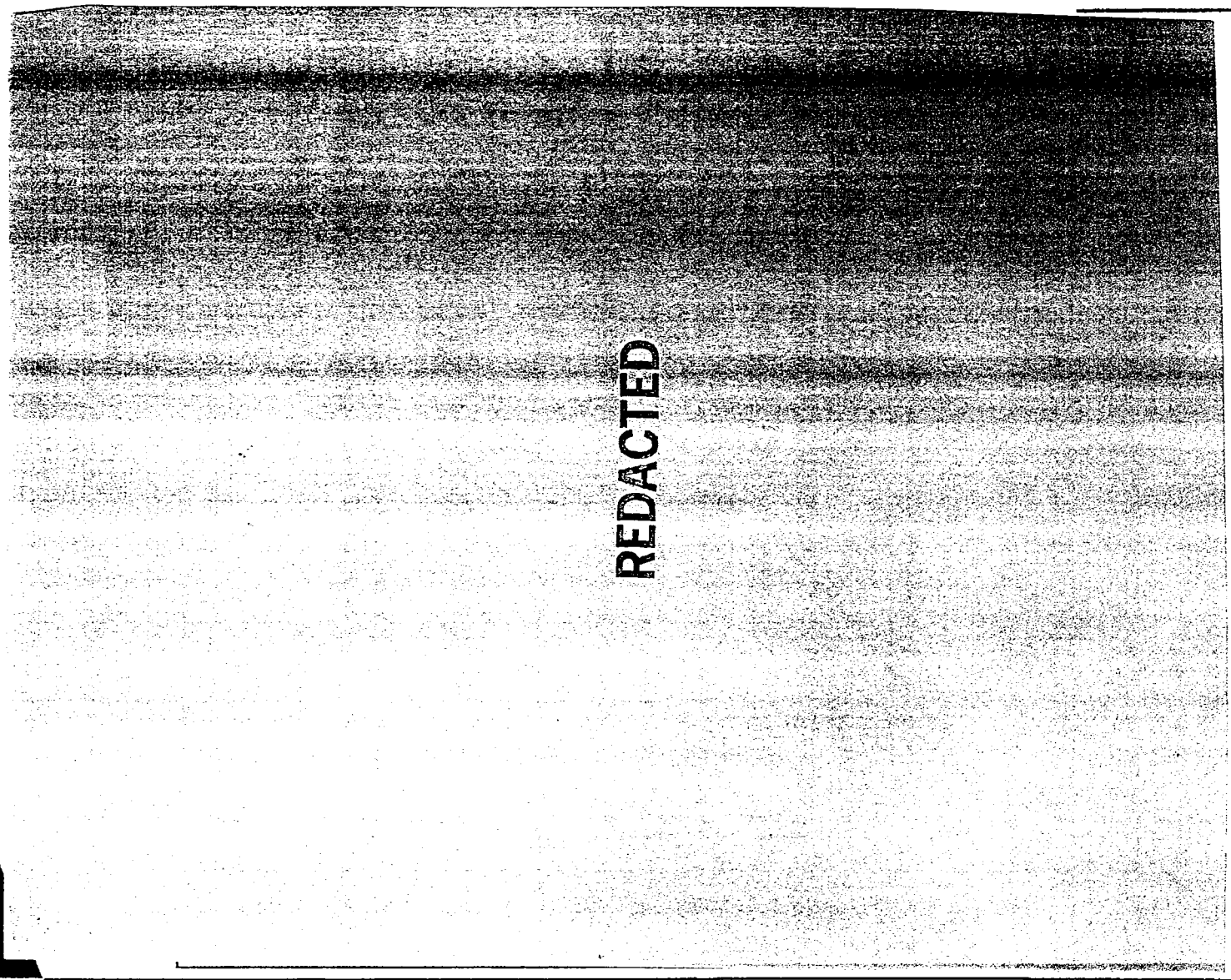


Metrics



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Project Price

- Held prices discussed at 11/17/06 meeting
- Fixed Price + Time and Materials

- 2006 Work

REDACTED

REDACTED

CONFIDENTIAL

Payment Schedule

Payment	Milestone	Estimated Date
REDACTED	December Submittals	1/2/07
	LAR Draft submittal to CR3 System Evals Reqd Hard Balance Uncertainty Calc	2/28/07 - 5%
	Task Spreadsheet for FSAR update, Req. Info Summary LOCA M&E & RB Response Analysis 1 LAR 2002-003	3/1/07
	FIDMS Version 1.8 Installed at CR3	4/5/07
	MS Temp & Press EC 65628 to CR3 ✓	TBD
	MUR EC 65627 to CR3 ✓	7/19/07 - 5%
	Caldon EC 65626 to CR3 ✓	7/31/07
	Completion of start-up testing (15R)	12/15/07

The final [redacted] payment will be adjusted for the difference between 2006 estimated and actual billings.

REDACTED

Time and Material work is estimated at [redacted].

REDACTED

Summary

- Level 1 schedule defined.
- Initial deliverables are proceeding.
- Heat Balance Uncertainty and emergent supporting calculations are critical path.
- Fixed price proposal presented.
- Metrics resolved.

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AGENDA

- > Division of Responsibilities
- > Price Comparison / Pricing
- > Monitoring and Metrics
- > Guarantees

CR3 Responsibilities

- NSSS Program Reviews
- BOP Program Reviews
- Tricon EC
- Owner Acceptance of AREVA System Reviews
- LAR Input and Submittal
- Grid Stability
- Final Tech Spec Preparation
- Procedure Revision
- Owner Acceptance of AREVA EDBD Revisions
- Operator Training
- Simulator Revision

Final DOE for these?

AREVA Responsibilities

- NSSS System Review
  - Fluid Systems
  - I&C Systems
  - Structural and Material Systems
- Safety Analysis
  - Review Chapter 14 Analysis
  - Revise LOCA M&E Results
  - Evaluate Safety System Setpoints
  - Revised Containment Pressure and Temperature Response
  - Appendix R Analysis
- Thermal Hydraulics Analysis
  - New Operating Conditions – FSPLIT, VAGIN
  - Heat Balance Uncertainty Calculation
  - Update PEPSE Model
  - Define Simulator Inputs

AREVA Responsibilities

- **Fuel America Activities**
  - Nuclear Analysis
  - Core Thermal Hydraulics
  - Fuel Assembly Mechanical Analysis
  - Startup Testing
  - Replace NAS with FIDMS
- **BOP Systems**
  - Fluid Systems
  - Electrical Systems
  - Structural Systems
  - HVAC Systems
  - FAC Analysis

AREVA Responsibilities

- Licensing
  - Project Management
  - Project Controls
  - Scheduler
  - Responsible Technical Manager
  - NSSS Project Engineer
  - BOP Project Engineer
  - LAR Enclosure 2 Preparation
  - LAR Review
  - NRC RAI Response

ECs to Be Prepared

Engineering Change (EC)	Responsibility
Caldon Instrument Specification EC	AREVA NP
Caldon Instrument EC	AREVA NP
Main Steam RTD EC	AREVA NP
Main Steam Pressure EC 60-75k go back in. ←	AREVA NP (Not in proposal)
RPS High Flux and AMSAC Trip Setpoint Revision EC	AREVA NP
ICS Function Curve Revision EC	AREVA NP
Plant Computer EC (CP/PICS/SPDS)	AREVA NP
Caldon Software V&V 0157	CR3
Tricon EC	CR3
MUR EC	AREVA NP

Plan to look @ loading analysis for part 2 MUR

Price Comparisons/Pricing

MUR Price Comparison Summary				
All values in 2007 ($000) except hardware				
4% escalation	2001	2001	2005	2007
	Robinson	Davis Besse	Seabrook	CR3
Licensing				
NSSS				
Fuel				
BOP				
EC/ Mod Packages				
Eng Sub Total				
Hardware				
Installation				
Total				

REDACTED

AREVA contract

* Does not include Fuel or EC cost

10% on contingency?

AREVA NP Inc.

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REDACTED

+ come down [redacted] due to changes on what part really went to fuel

NSSS Details

	Robinson		CR-3		
WBS Item	**MHrs.**		**MHrs**	**Cost**	
NSSS					
Operating Conditions	260		400	REDACTED	
Interviews	36		252		
NSSS Components	256		328		RIS 2002-003
NSSS Systems	400		860		8 systems vs 12 systems
SG FIV	800		428		No analysis/RIS 2002-003
Safety Analysis	580		410		RIS 2002-003
I&C Evaluations	225		300		6 systems vs 12 systems
LAR/USAR input	680		750		RIS 2002-003
RAI response	250		280		
Project Management	640		850		
Sub-total	**4127**		**4858**		

Manhour differences due to increased systems reviews and RIS compliance

NSSS Delta Scope Robinson and CR3

	Robinson		CR-3		
WBS Item	**MHrs.**		**MHrs**	**Cost**	
NSSS					
NSSS Programs	200		0		
AFW Analysis	340		0		
Feasibility Study	750		0		Half of Feasibility study effort
DH Calc	815		0		
Sub-total	**2105**		0		
Heat Balance Uncertainty	0		320		
Benchmark and Revise PEPSE	0		300		
ICS Header Press	0		128		
Simulator Inputs	0		100		
NSSS Flu & Rad Analysis	0		168		
Tech Spec updates	0		208		
M/E and Containment	0		700		Performed by Westinghouse
Project Controls	0		120		
Consultant	0		450		
Calc/Proc. Update	0		1000		← Contingency
EDBD's	0		96		
ARTS	0		400		
Appendix R Analysis	0		133		
Sub-total	0		**4123**		
					Difference
NSSS Total	**6232**	[redacted]	**8981**		$ [redacted]

REDACTED

REDACTED

REDACTED

* Robinson was a fixed price contract escalated to 2007. CR3 is T&M.

NSSS Fuel Details

WBS Item	Robinson MHrs.		CR-3 MHrs	Cost	
Fuel	0	0 *	2640	REDACTED	Compares to 2300 mhrs for HTP cycle 14 for CR3.
FIDMS	0	$ -	1000		
Fuels Total	0	$ -	3640		

* Robinson fuel cost included in separate fuel contract

BOP Details

Area of Interest	Robinson Cost	CR3 MHrs	CR3 Cost
SE/DE Interviews		97	REDACTED
BOP Systems (includes BOP PE)		860	
HVAC		511	
BOP Electrical and I & C		450	
BOP Structural Evaluation		330	
Pipe Spec Review		290	
Licensing Document Input and Support		160	
Calculation update		1000	
EDBD's		80	
FAC Analysis		140	
Total BOP Licensing	[redacted]	**3918**	

REDACTED

REDACTED [redacted]

No Robinson manhours available

• Includes T&L and Supervision

Price Comparisons/Pricing

EC Details

	MHrs.	Cost
Caldon EC*	4424	
NSSS I&C EC		
RPS/AMSAC	500	
ICS Function Curves	500	
MS RTD	700	
MS Pressure	**TBD**	
MUR EC	860	
Tricon EC		
RE Caldon	1428	
RE I&C	245	
TOTALS	**8657**	

REDACTED

* Caldon V&V Justification by CR3

Computer EC in Fuels Scope

No Comparable Robinson Cost

Price Comparisons/Pricing Summary

- > **RIS 2002-003 requires more systems to be evaluated and previous NRC approvals documented.**
- > **Significant increased scope for CR3 versus Robinson**
- > **Subcontracted Project results in higher manhour chargeout rate as compared to internal CR3 rates**

For T+M

Project Monitoring

> **Burn Curves**

AREVA will develop burn curves for monitoring budget performance. Two curves will be maintained:

(1) Total Project Manhours (Projected and Actual)

(2) Total Project Dollars (Projected and Actual)

> **Earned Value**

- **CPI and SPI Curves will be generated**

> **Deliverable Document Progress**

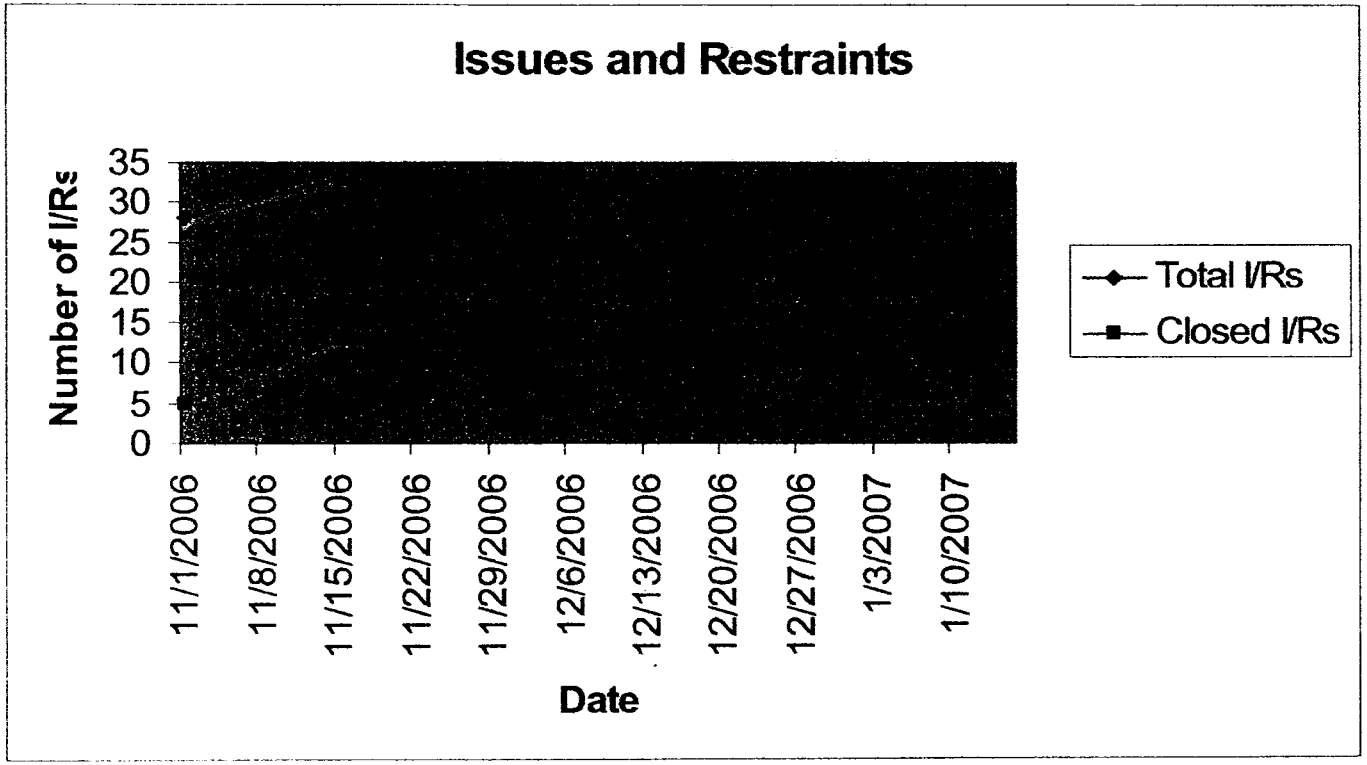
AREVA will maintain two curves:

(1) Number of scheduled draft documents vs time

(2) Number of delivered draft documents vs time

From RVCH Project

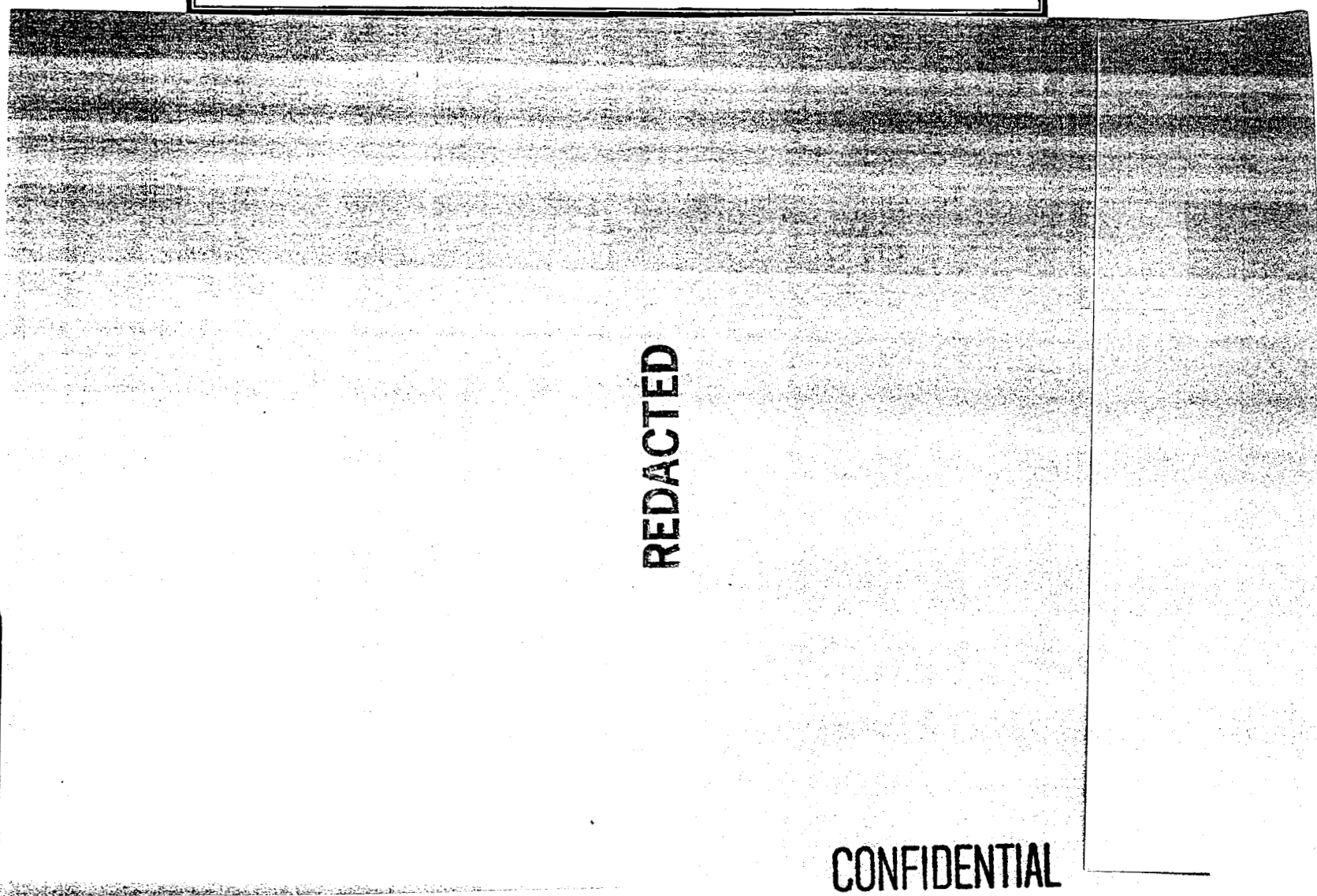
Issues and Restraints Progress



PEF-NCR-00204

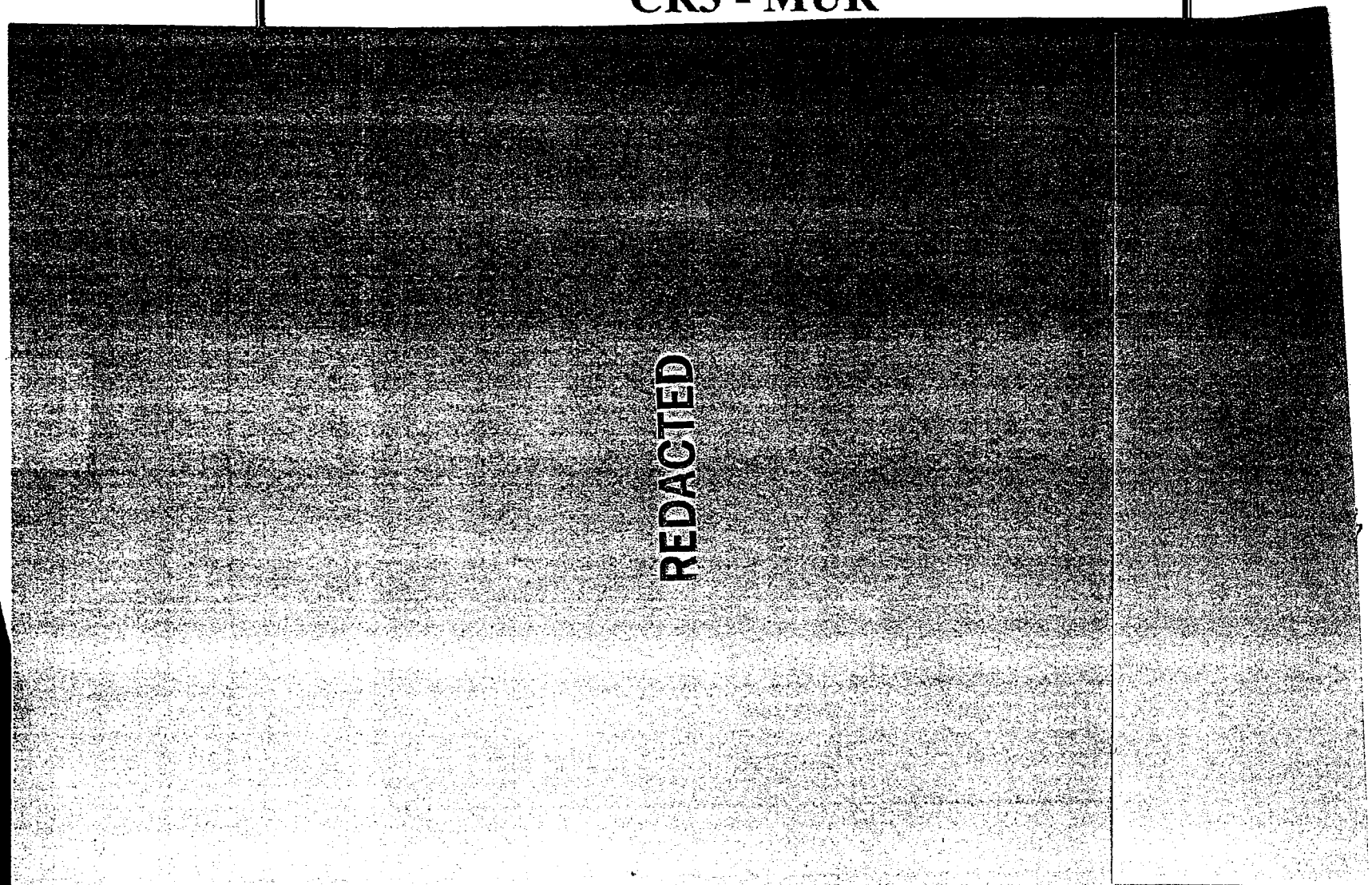
AREVA

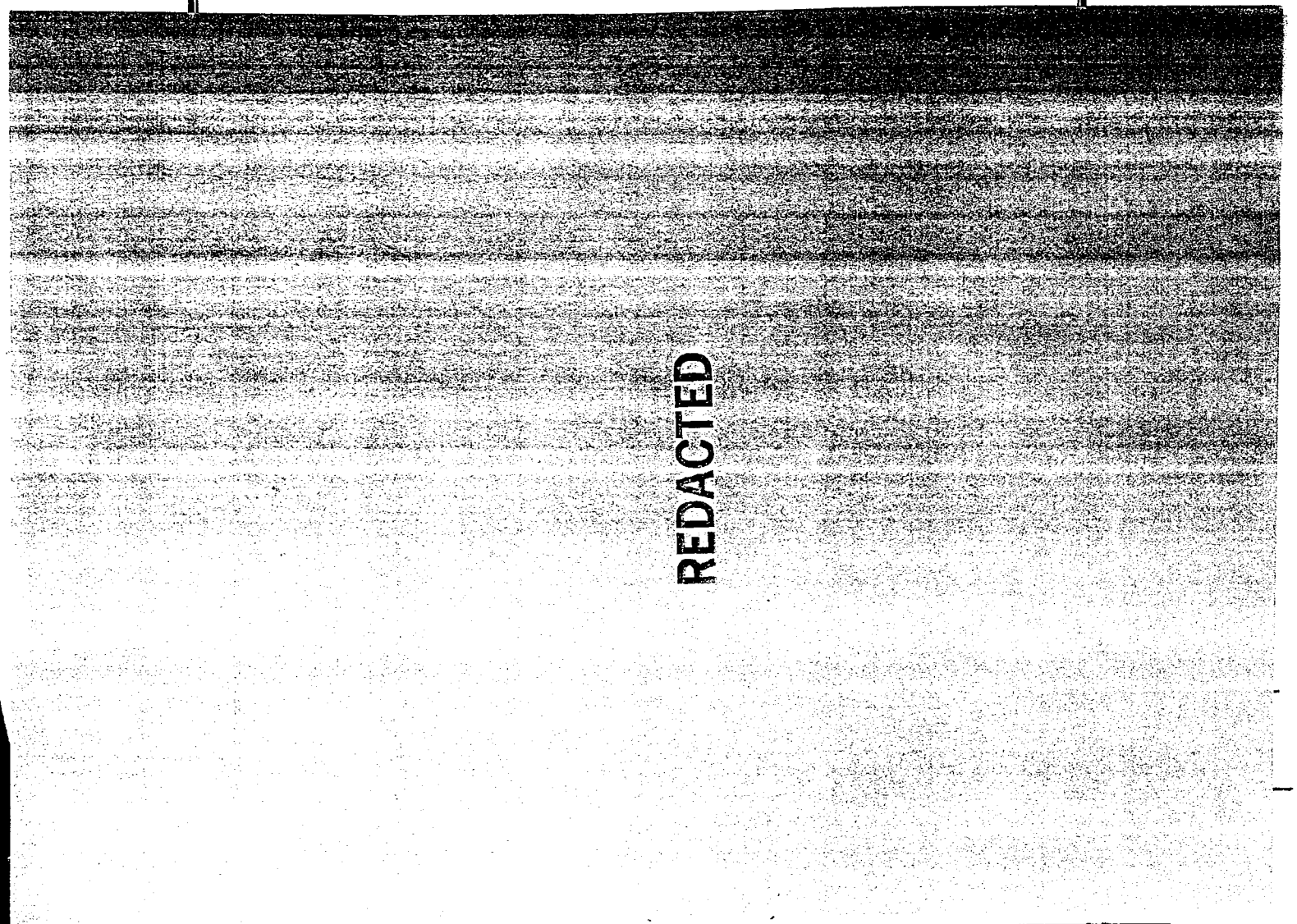
Incentive/Penalty: Target MWe
CR3 MUR



CONFIDENTIAL

Incentive/Penalty: Target Cost
CR3 - MUR





Target Schedule Based on AREVA Draft Submittal to CR3

Pricing Options

- Time and Materials
  - [redacted] REDACTED [redacted] Contingency [redacted]
- Fixed Price + Time and Materials
  - Fixed Price REDACTED
    - [redacted]
  - Time and Materials
    - RAIs [redacted] REDACTED
    - Uncertainty Calcs [redacted]
    - Contingency [redacted] REDACTED

REDACTED

Need to remove Section 1

AREVA

June 20, 2007
AREVA-07-01815

1) Redistribute LOI Fixed & T+M
2) Finalize Megawatt
3) Statement on revised price results from T.C. Lett
4)

Mr. Danny Roderick
Vice President, Nuclear Projects and Construction
Progress Energy
Crystal River Nuclear Plant
15760 West Power Line Street
Crystal River, FL 34428-6708

Subject: **Revised DRAFT Proposal NSSSE06-1023.0 for CR3 Extended Power Uprate (EPU) NSSS License Amendment Request (LAR) Support Project**

Attachment: 1. AREVA NP DRAFT Proposal for "EPU Project NSSS Portion for CR3"

References: 1. Progress Energy Letter CRVP07-0005, Letter of Intent (LOI) for the CR3 EPU NSSS LAR Support Project, February 27, 2007.

Dear Mr. Roderick:

AREVA NP Inc. (AREVA NP), an AREVA and Siemens company, is pleased to submit the attached revised proposal for CR3 Extended Power Uprate (EPU) NSSS License Amendment Request (LAR) Support Project. This proposal is the second draft issued for your review. It incorporates additional scope that your staff has requested along with clarification, comment resolution and price update. Please note also that we have engaged WorleyParsons to assist us on this project. Some of the additional workscope will be performed by them as you had suggested. We look forward to your favorable acceptance of this proposal and appreciate this opportunity to work with you on this project. As noted in our letter of April 23, 2007, we continue to work on this project based on your authorization in reference 1.

We anticipate working closely with you and your team to finalize the technical and commercial aspects of the NSSS phase of the project. Following those discussions, AREVA will issue a final proposal.

AREVA NP INC.
3315 Old Forest Road, P.O. Box 10935, Lynchburg, VA 24506-0935
Tel.: (434) 832-3000 - Fax: (434) 832-3840 www.areva.com

This proposal is proprietary to AREVA NP. If you have any questions concerning this proposal, please contact Dallas Scott at (434) 832-2937 or me at (561) 841-9174.

Sincerely,

for

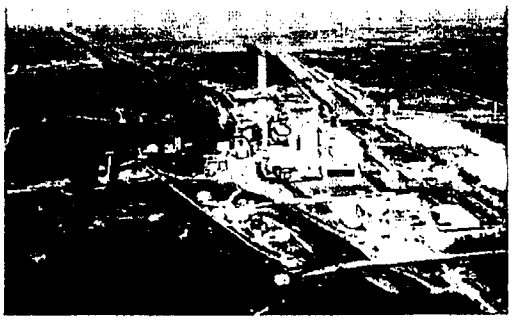
Skip Hudson
Regional Manager
AREVA NP

cc: Jim Terry – CR3
Ted Williams – CR3
Debbie Hanna -CR3
Lee Williams – AREVA NP
Gary Mignogna – AREVA NP
Ken Greenwood – AREVA NP
Dallas Scott – AREVA NP
Ed Kane – AREVA NP
Tom Franch – AREVA NP
Tony Owen – Raleigh, NC
Dennis Napior – AREVA NP

PROPRIETARY

AREVA

Extended Power Uprate (EPU) Project
Nuclear Steam Supply System (NSSS) Portion
For CR-3 Nuclear Power Station



AREVA Proposal
No. NSSSE06-1023.0
Revision DRAFT

Dated: June 20, 2007
Validity: June 30, 2007

Prepared By:

AREVA NP Inc.
3315 Old Forest Road
P.O. Box 10935
Lynchburg, Virginia 24506-0935

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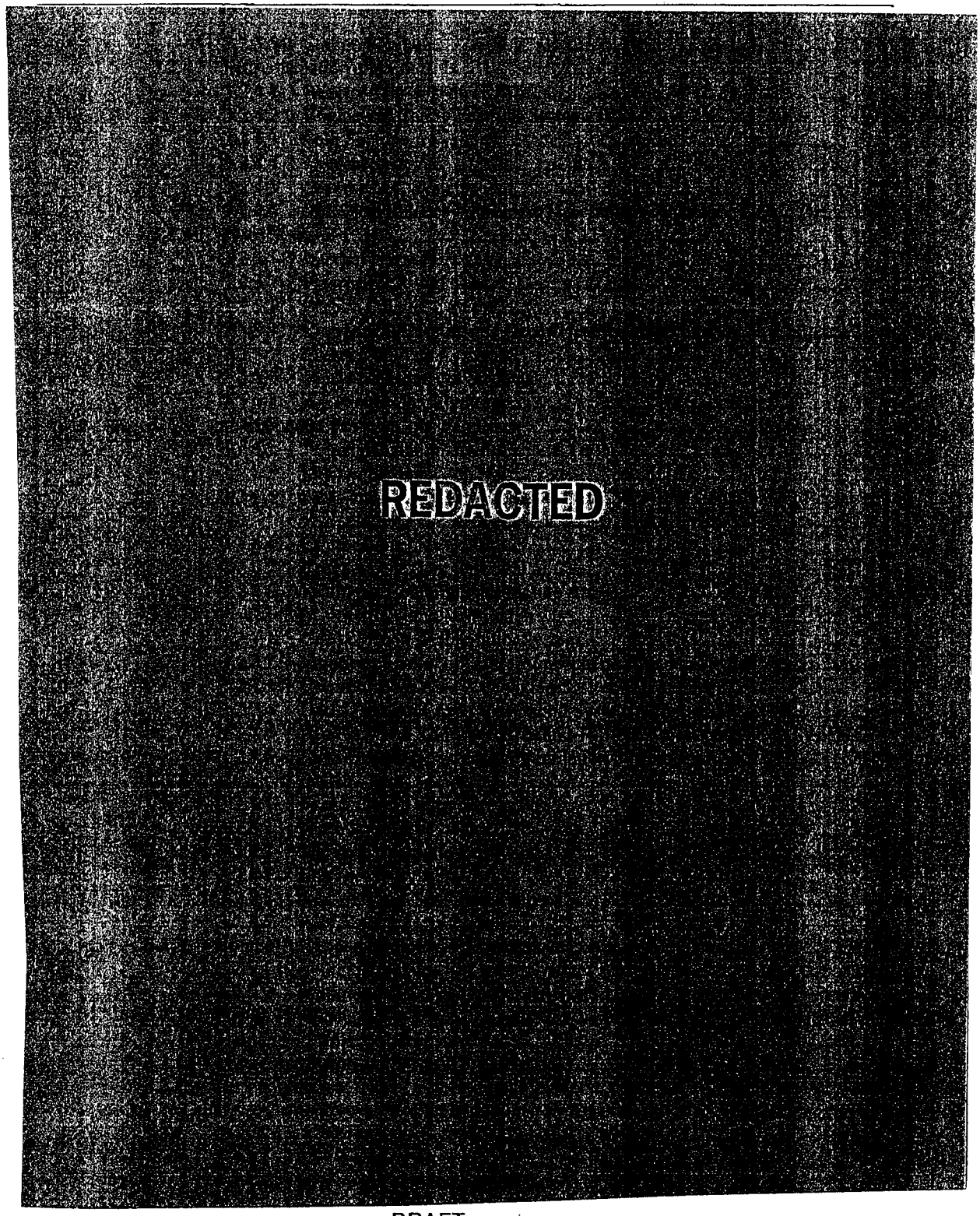
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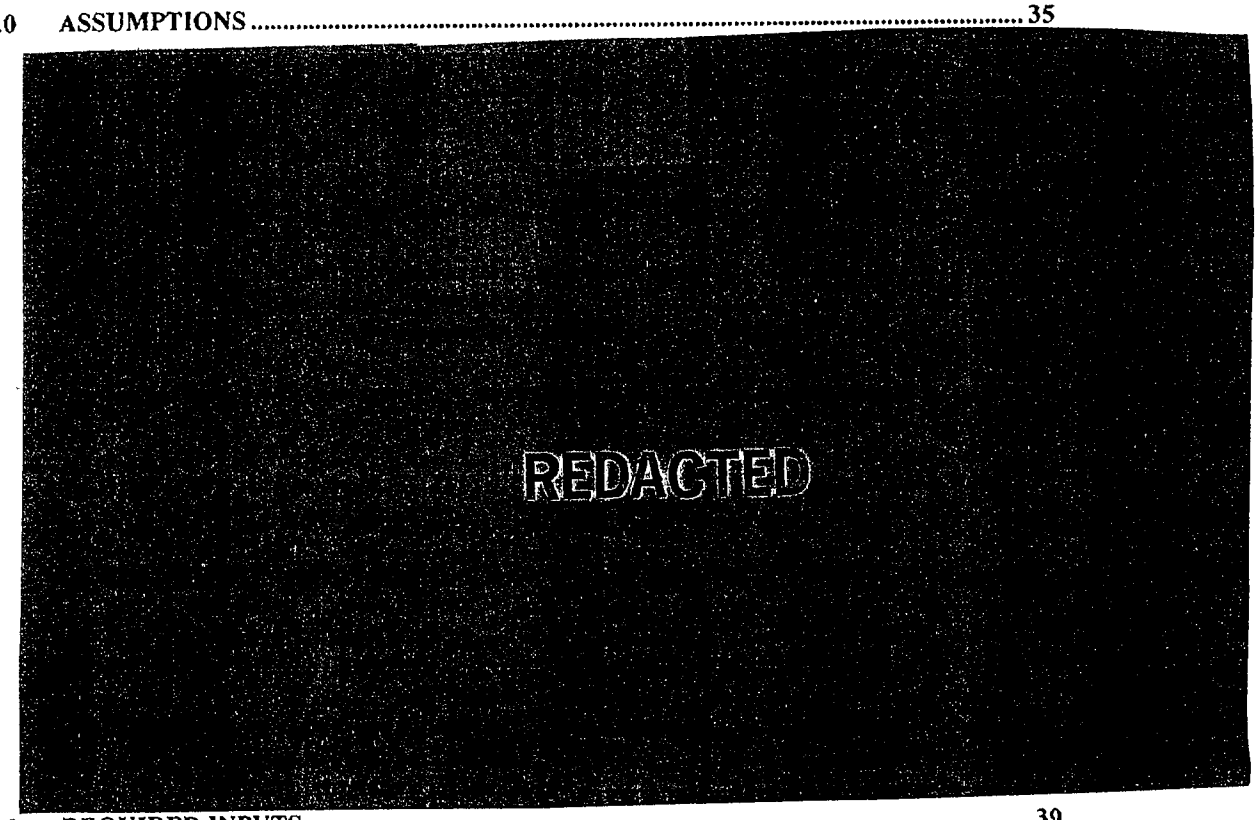

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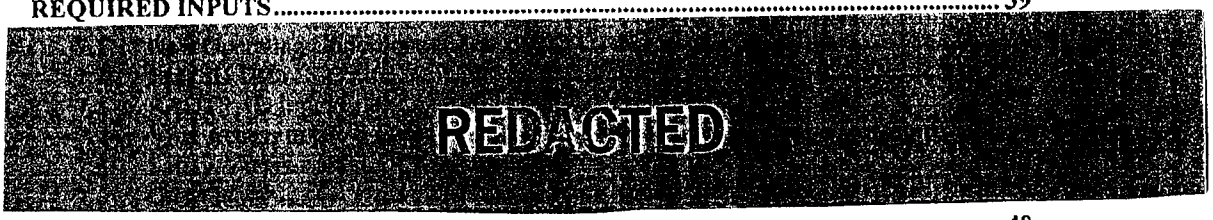

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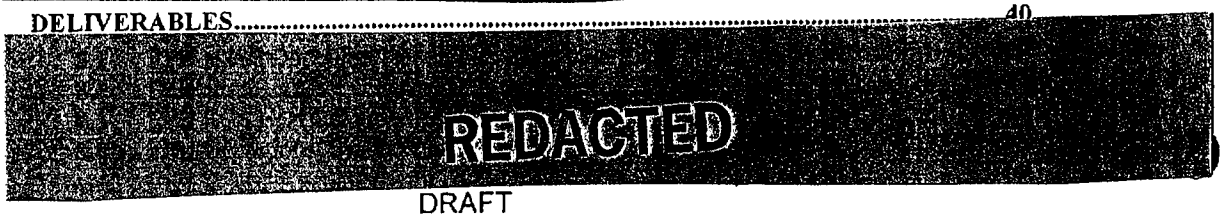

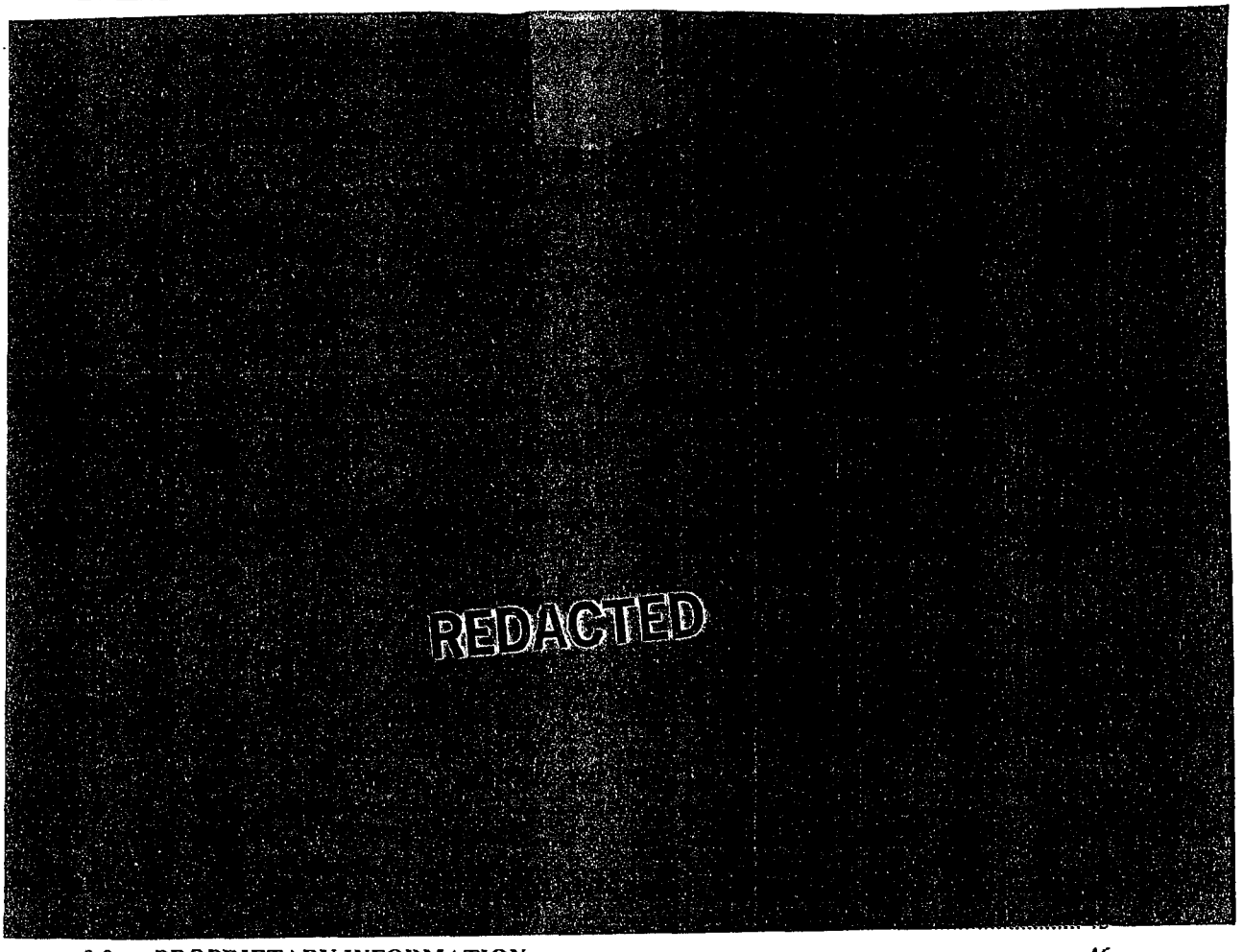

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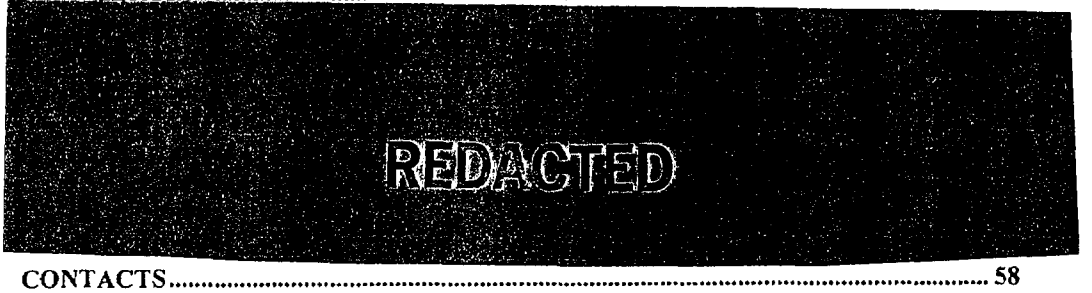

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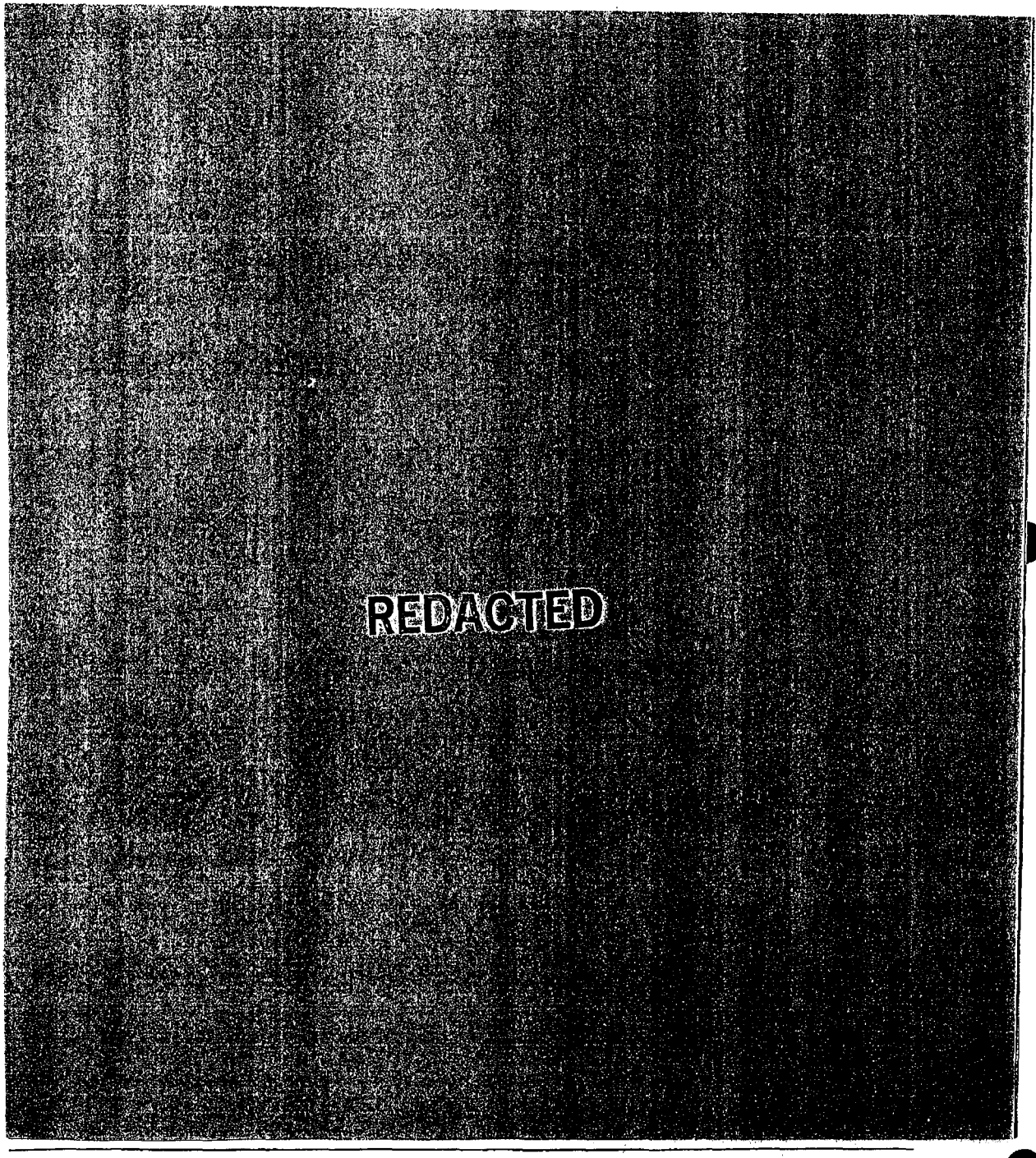
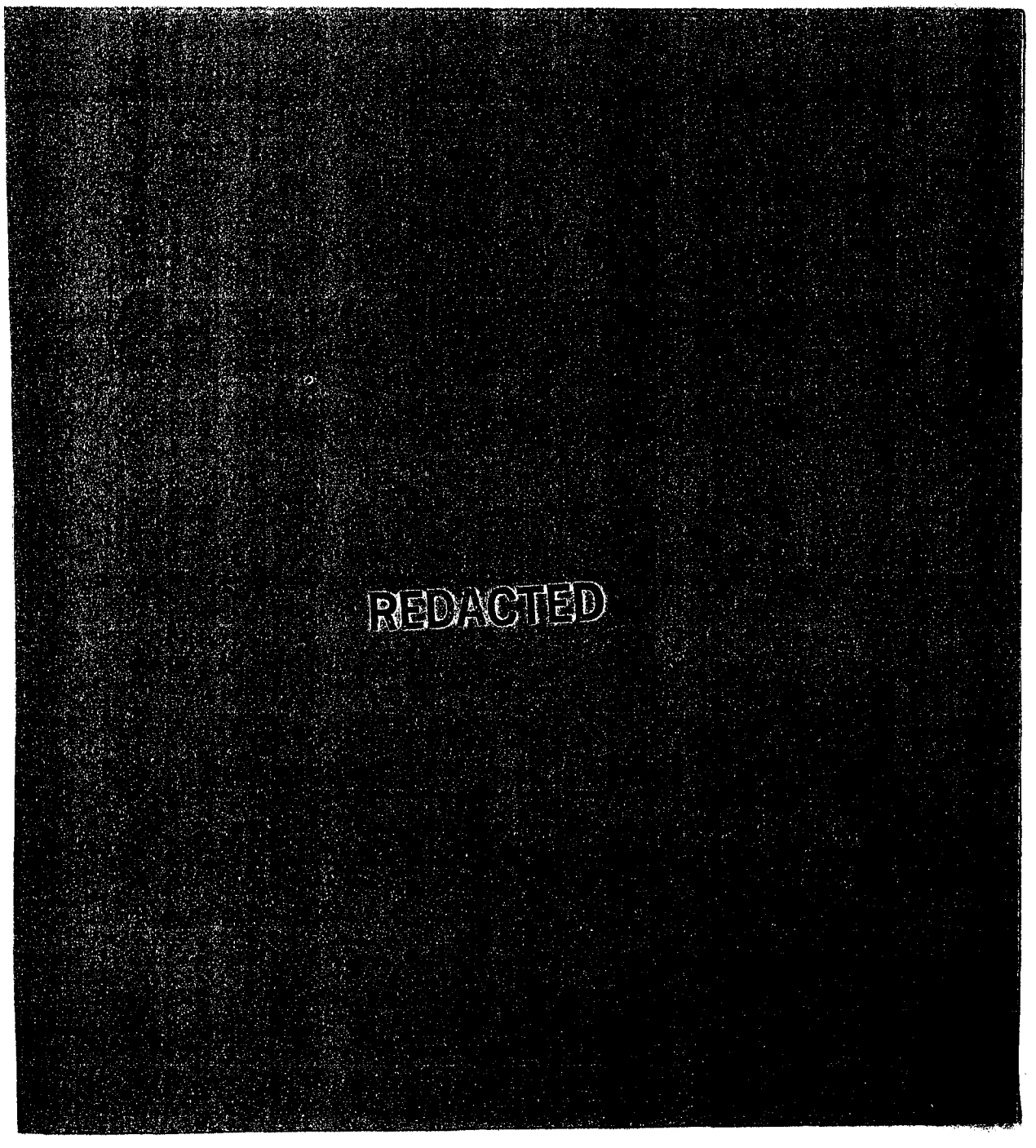
Executive Summary

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1.0 INTRODUCTION

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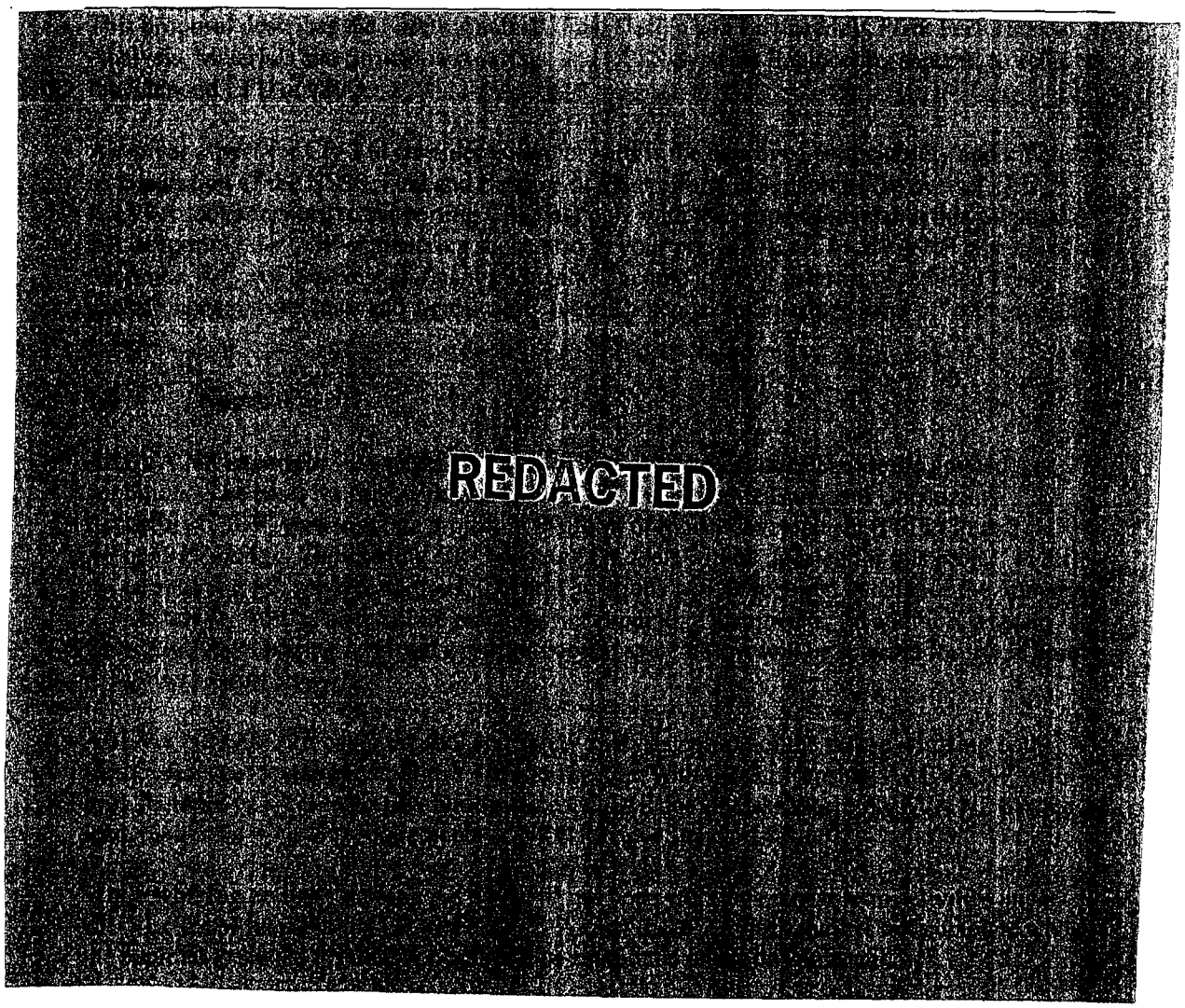
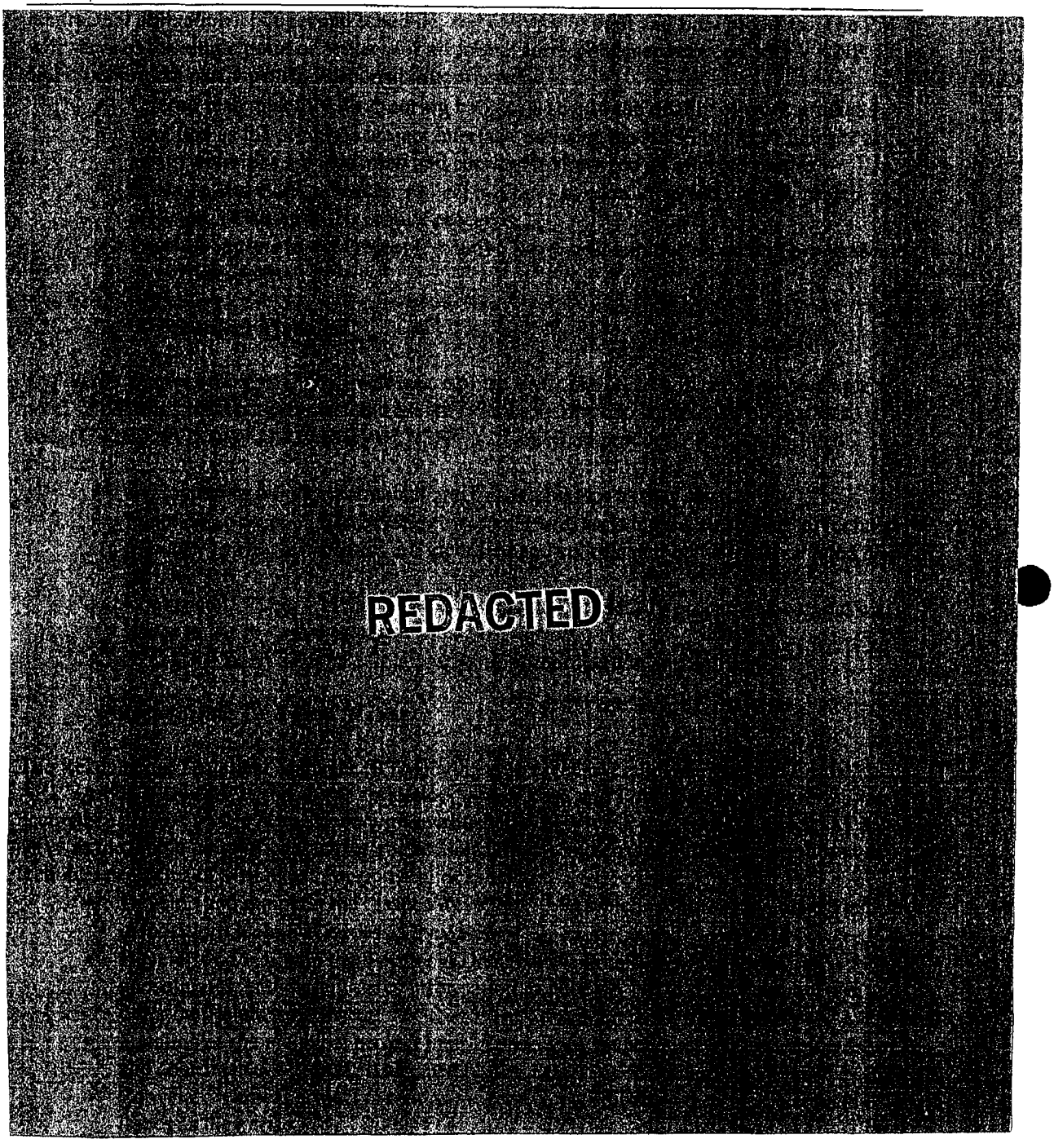


2.0 PROJECT TEAM ORGANIZATION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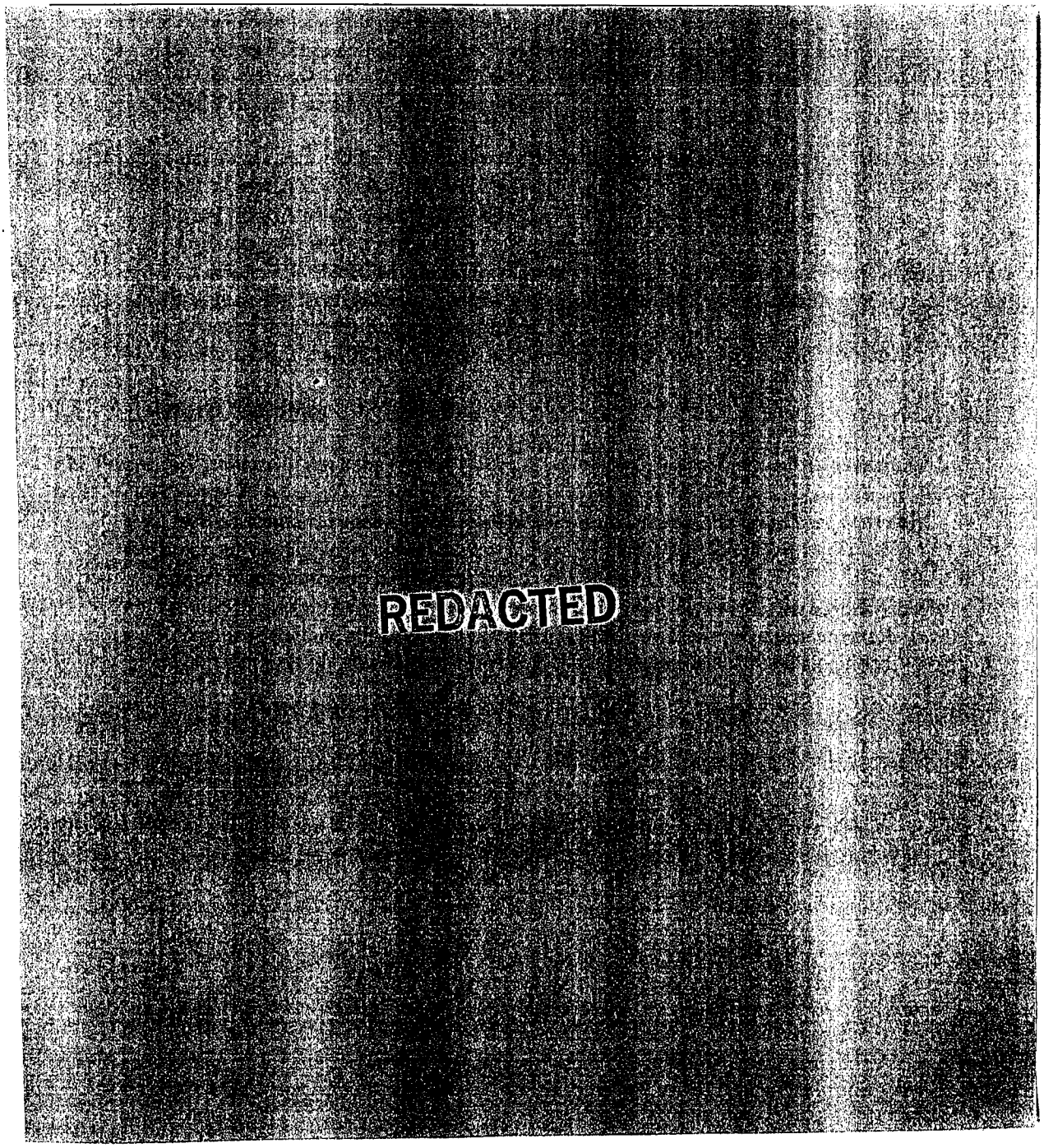
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Project Organization

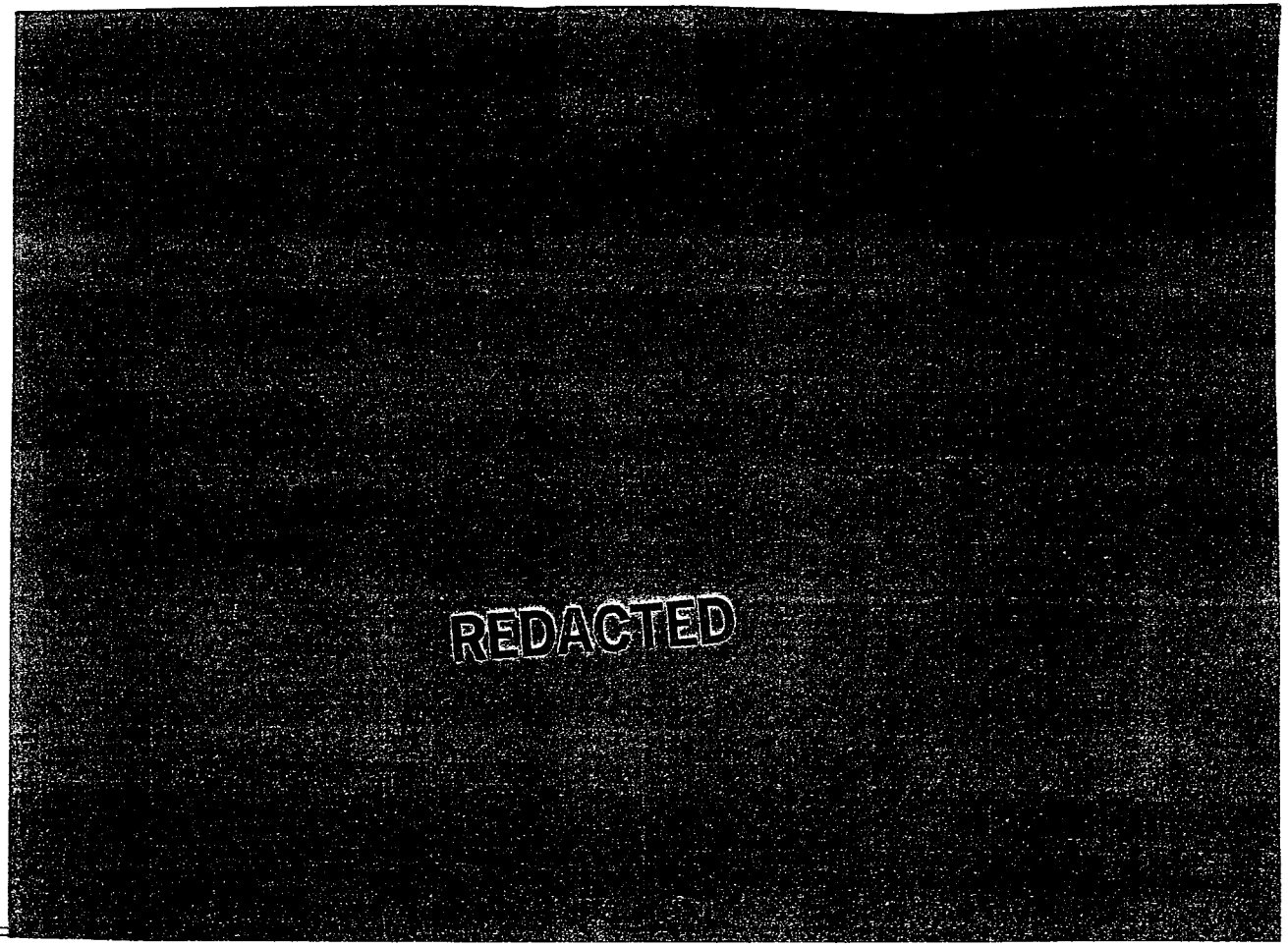
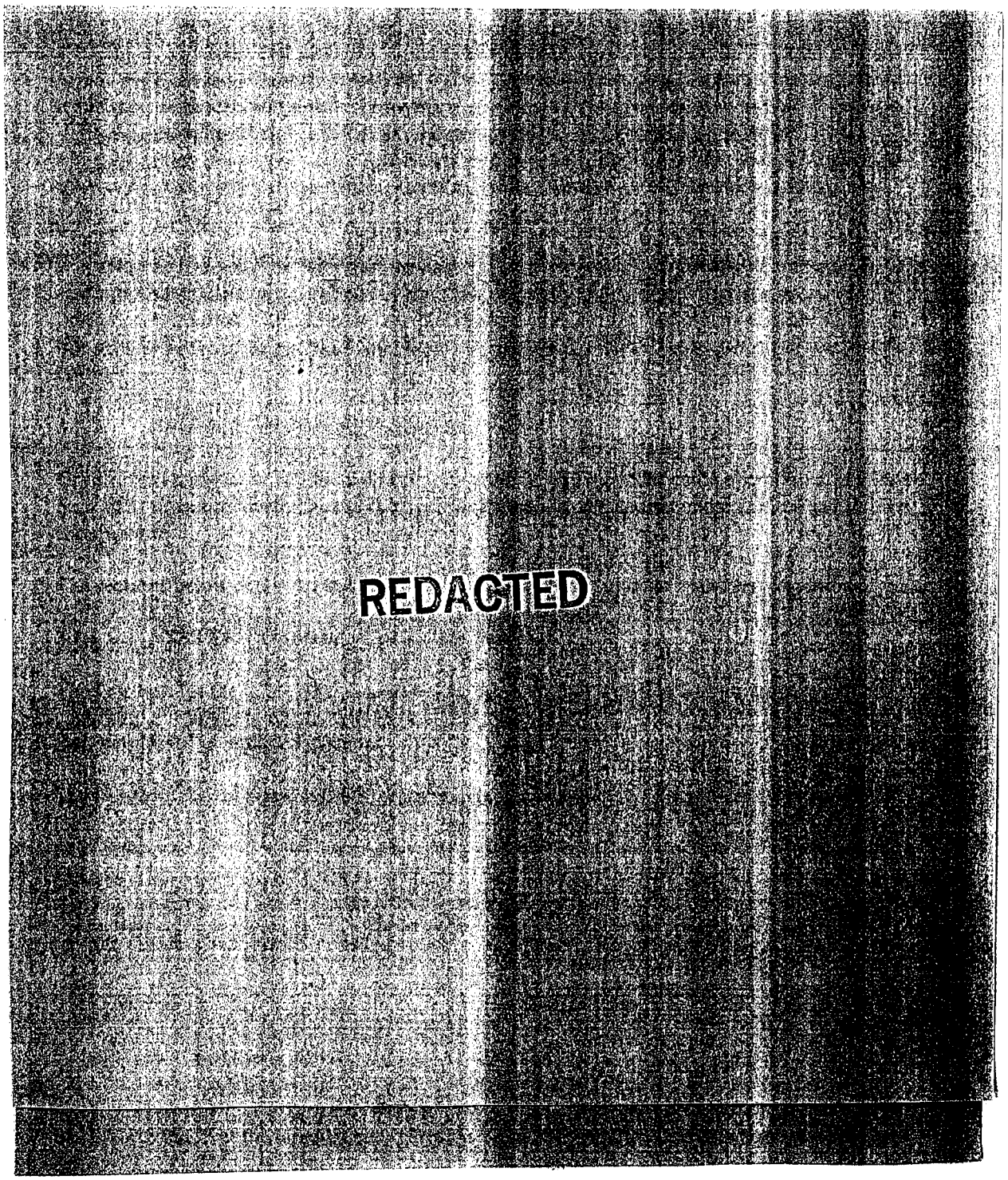


Figure 1: AREVA EPU NSSS Project Team

3.0 WORKSCOPE



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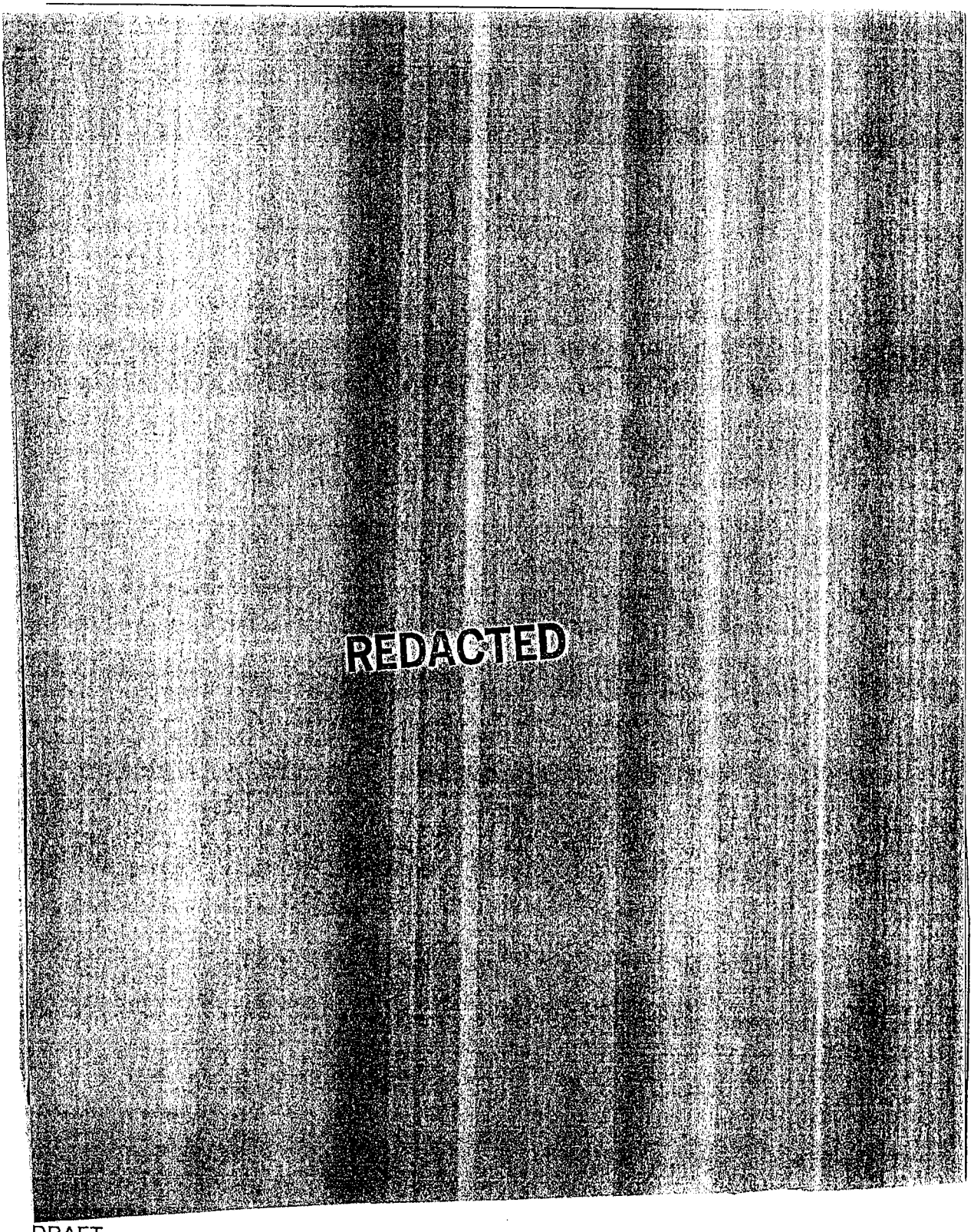
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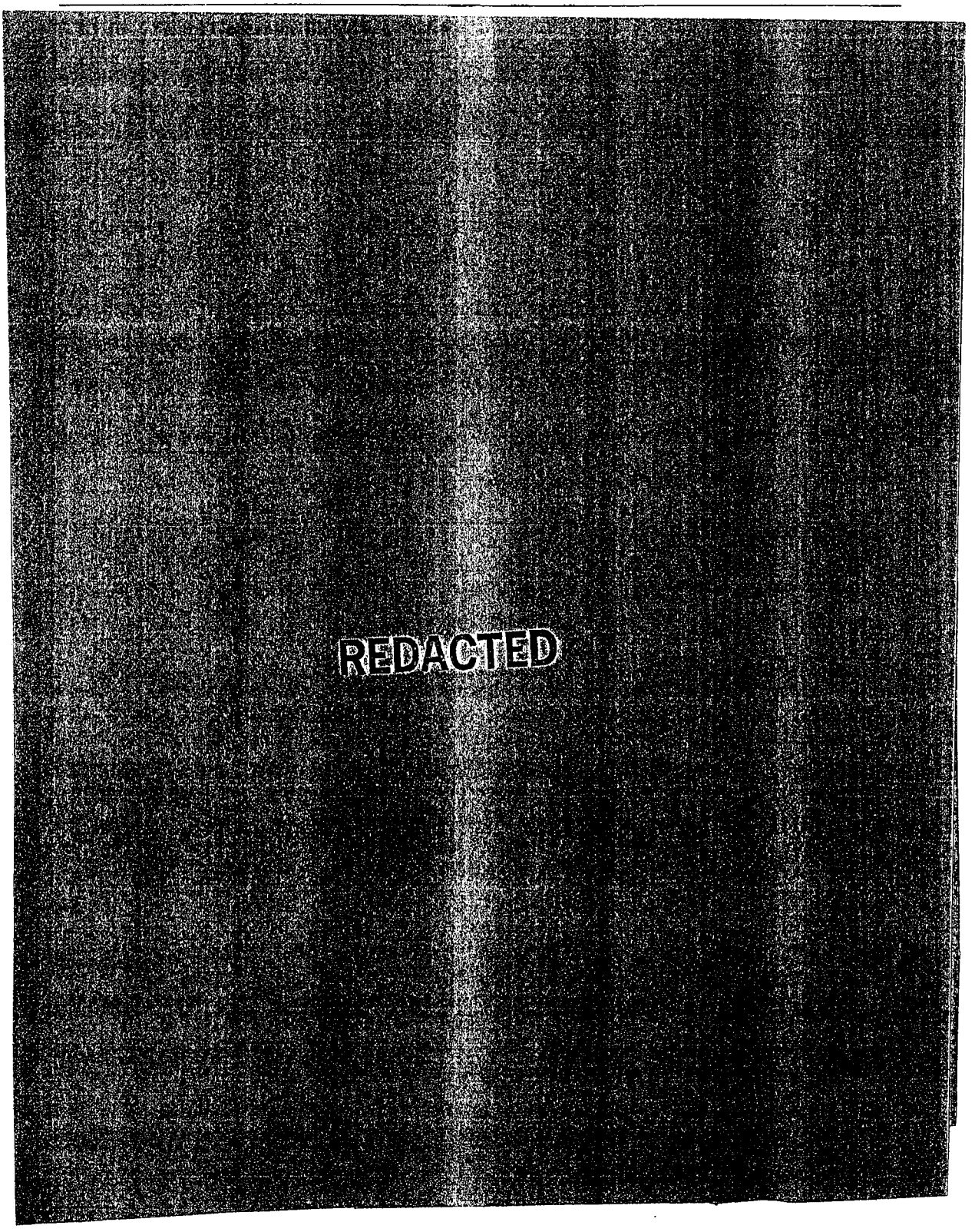
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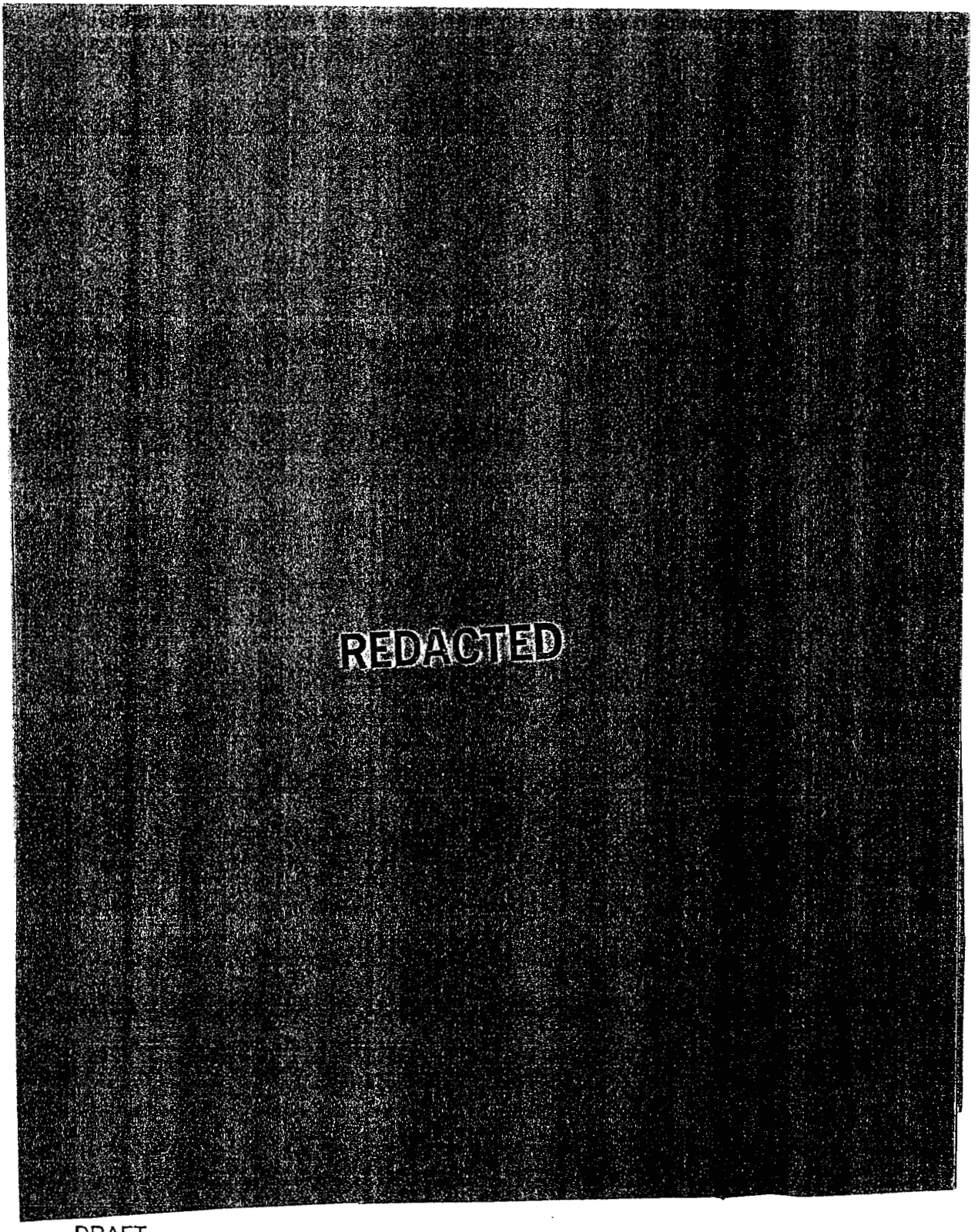
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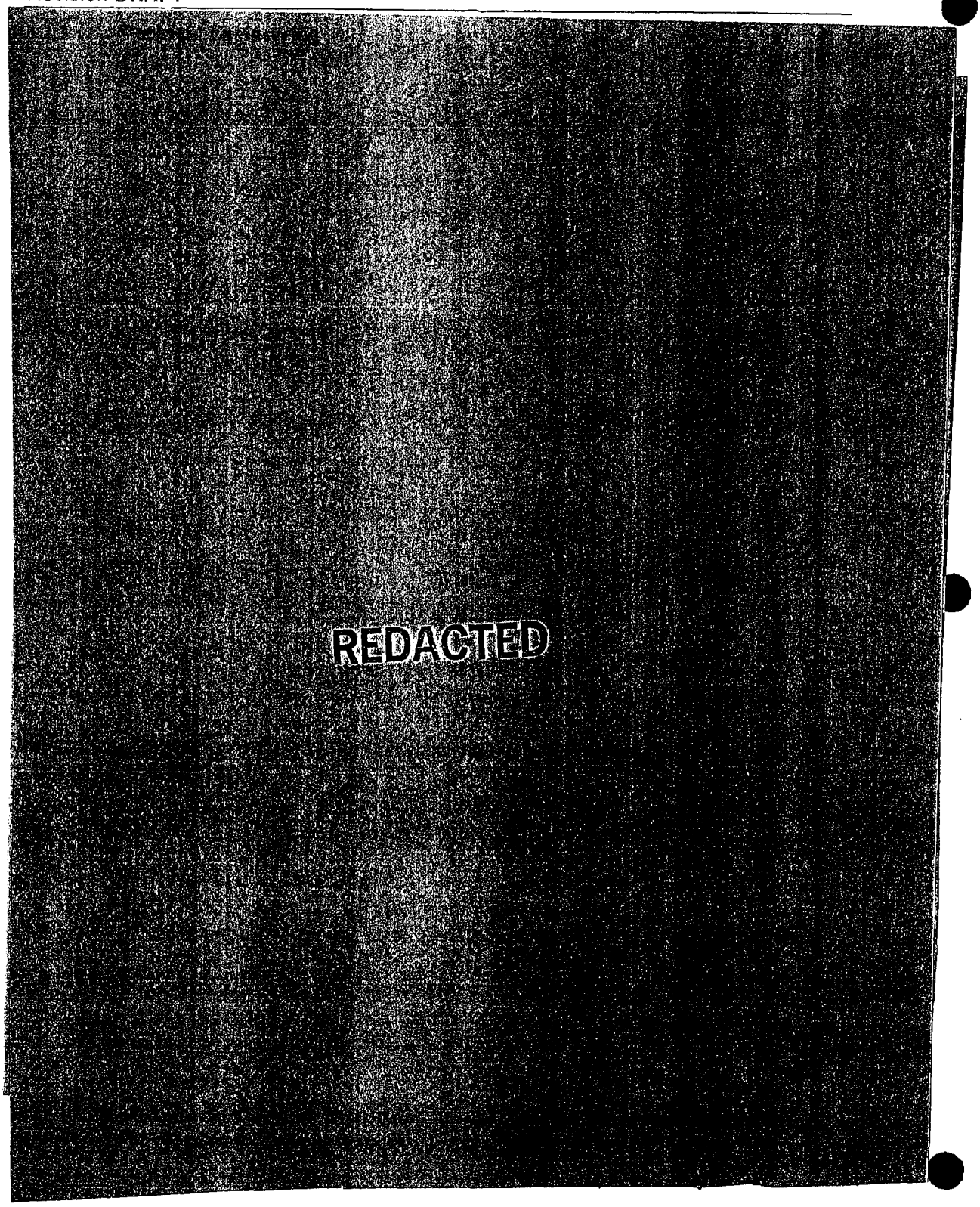
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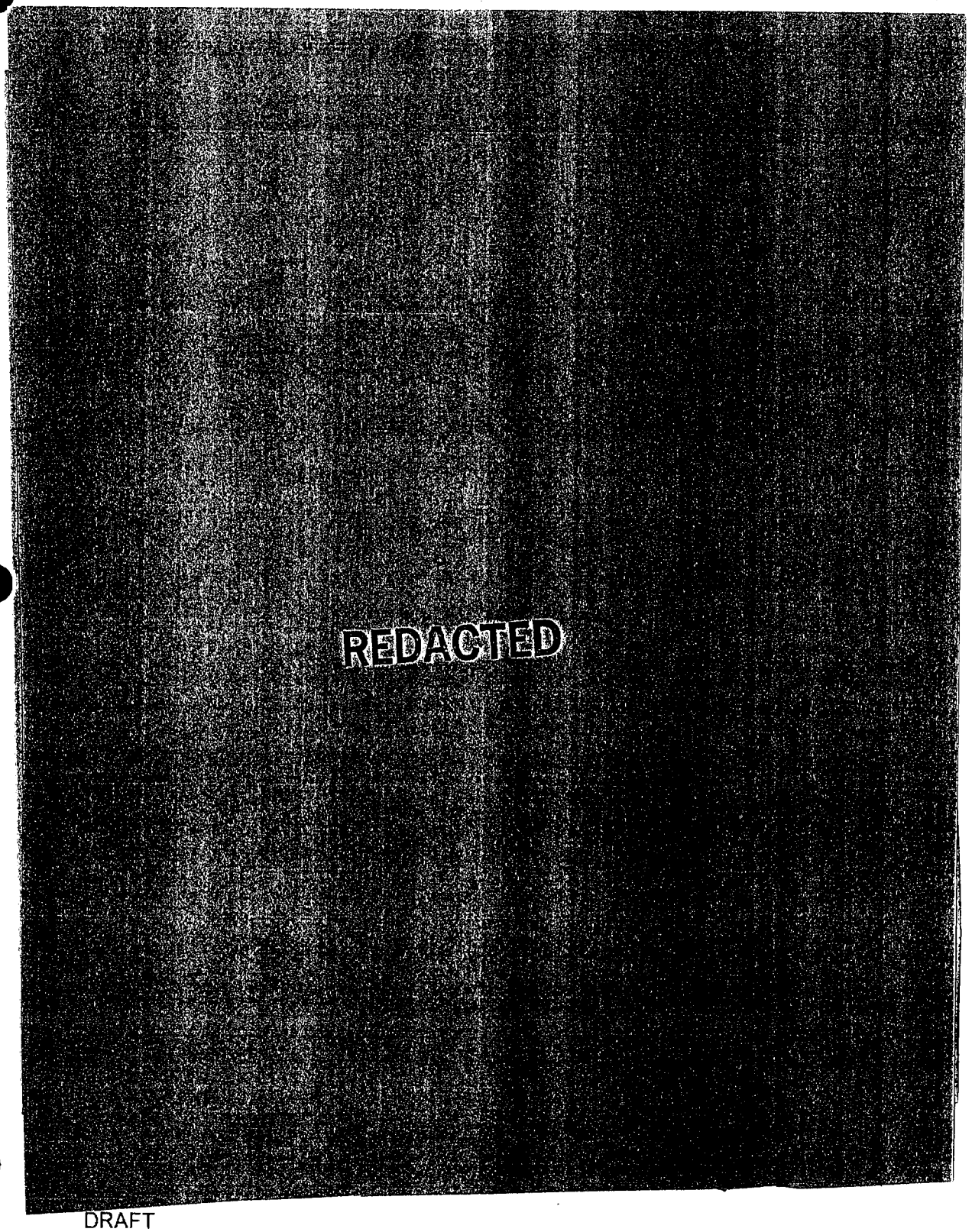
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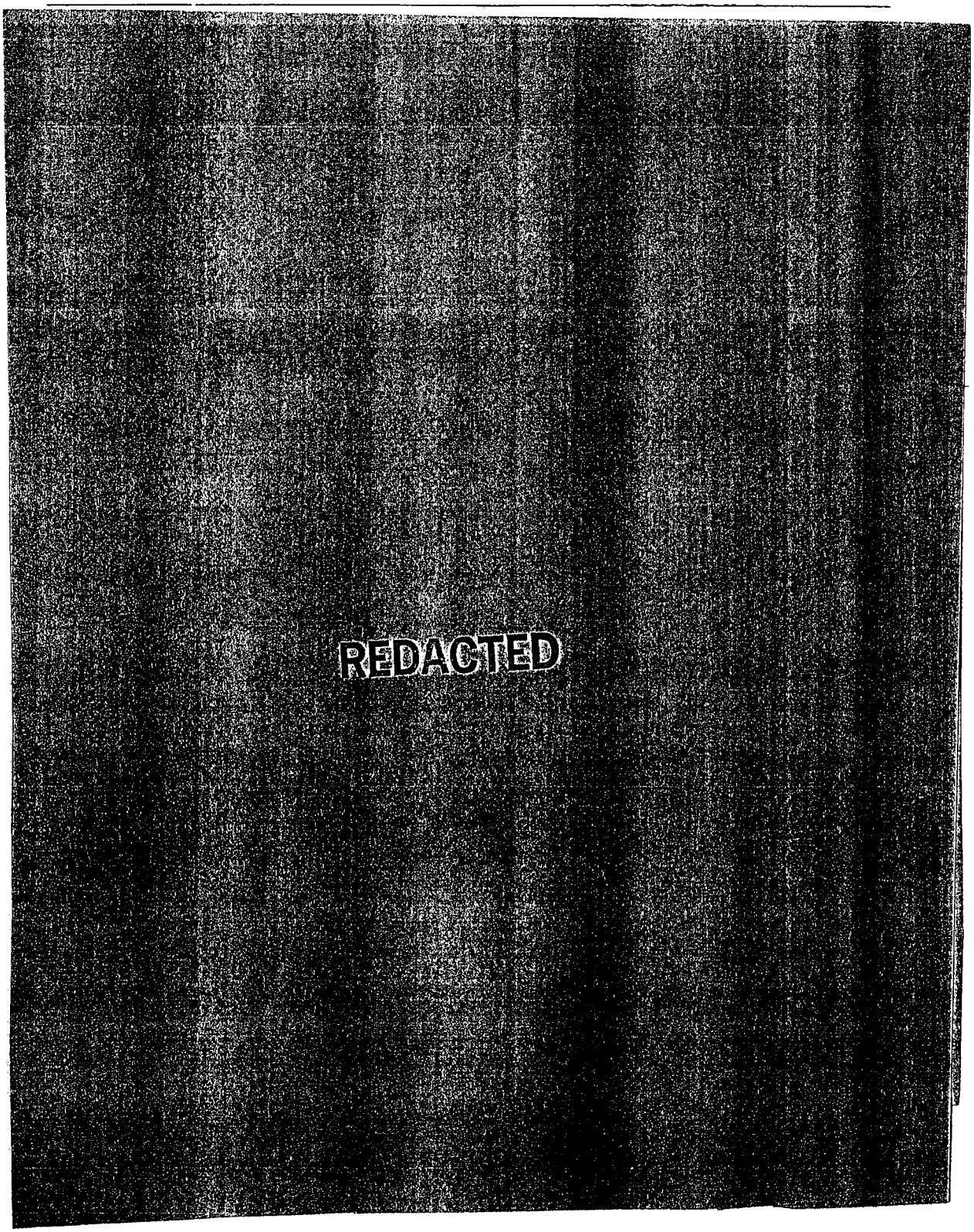
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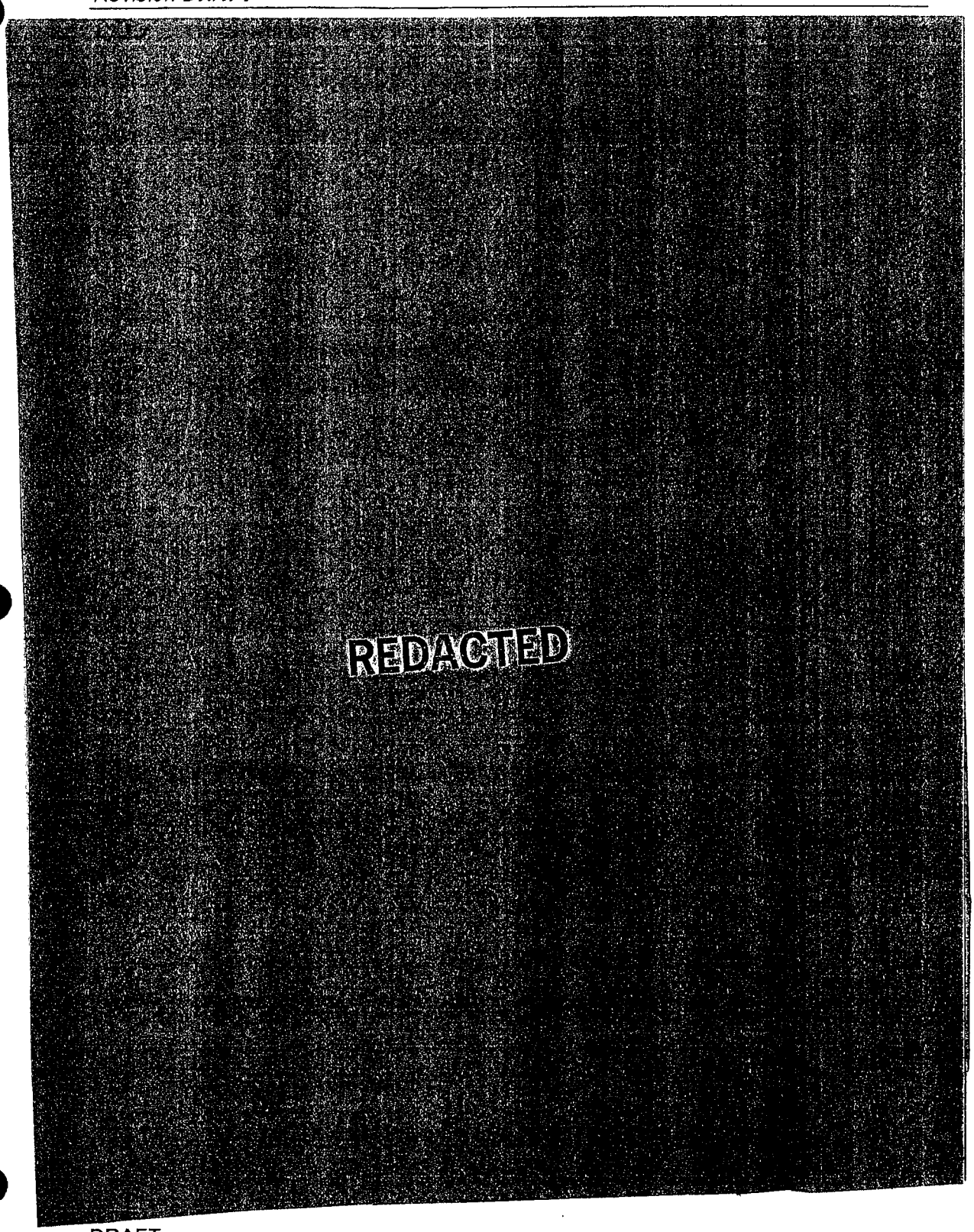
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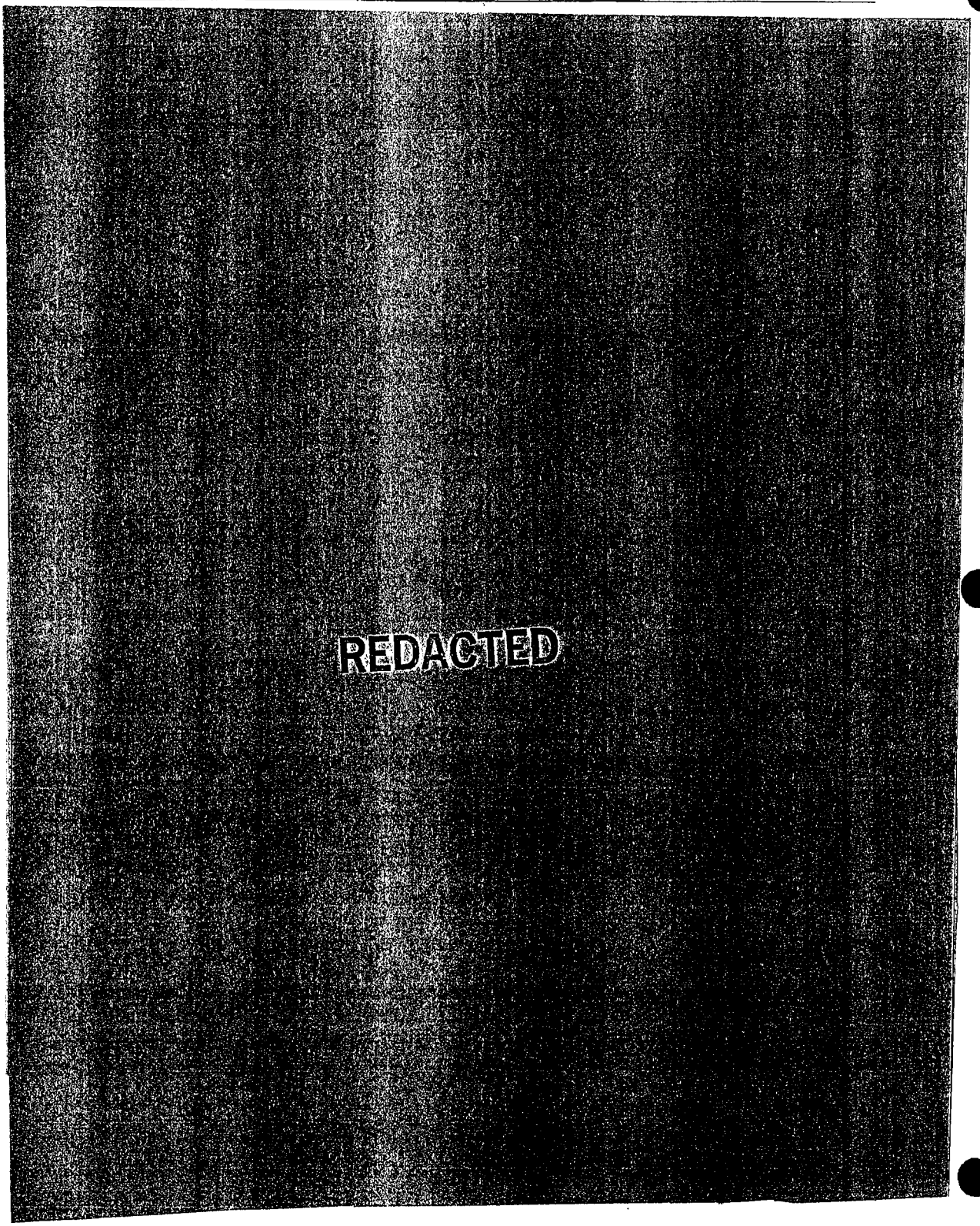
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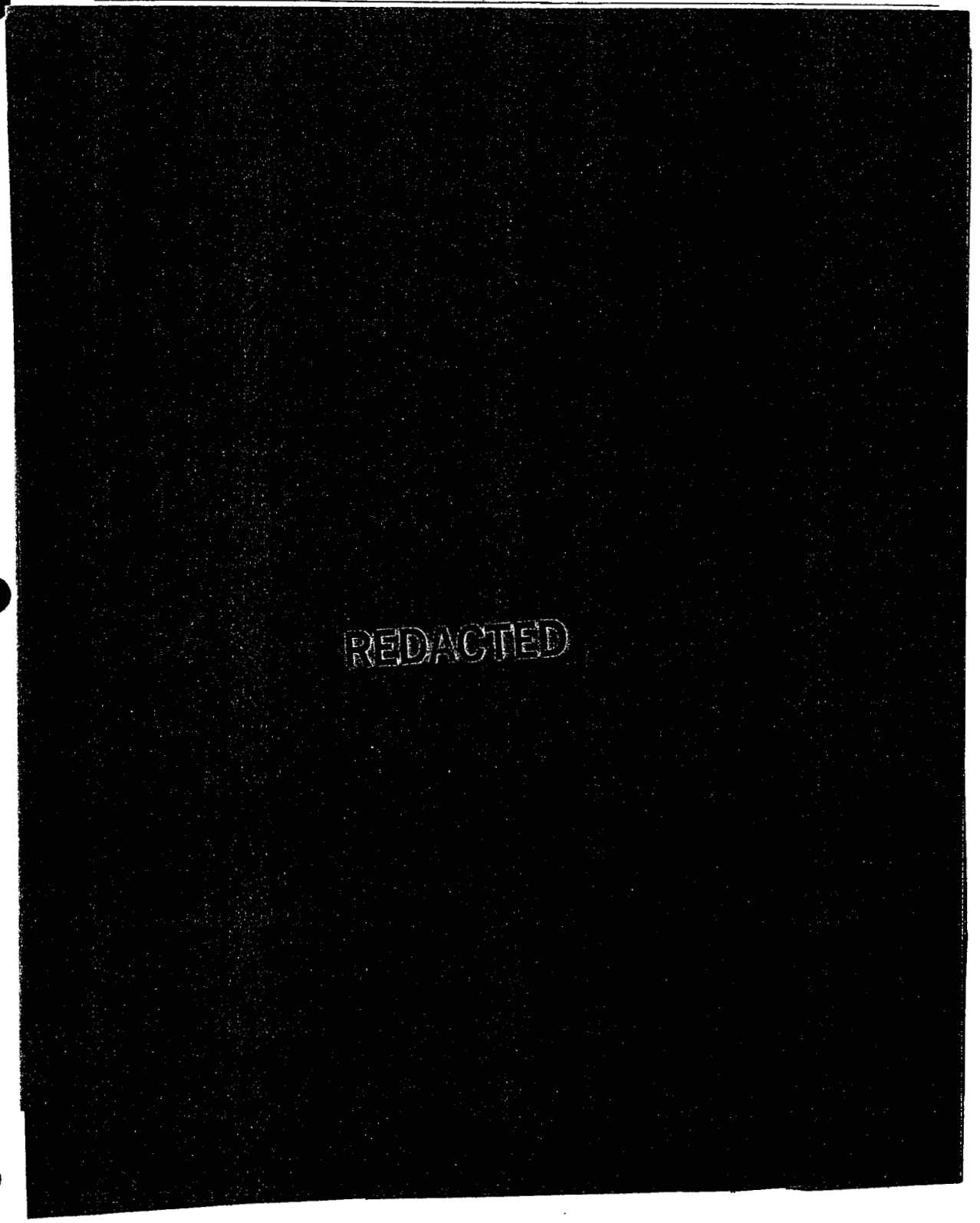
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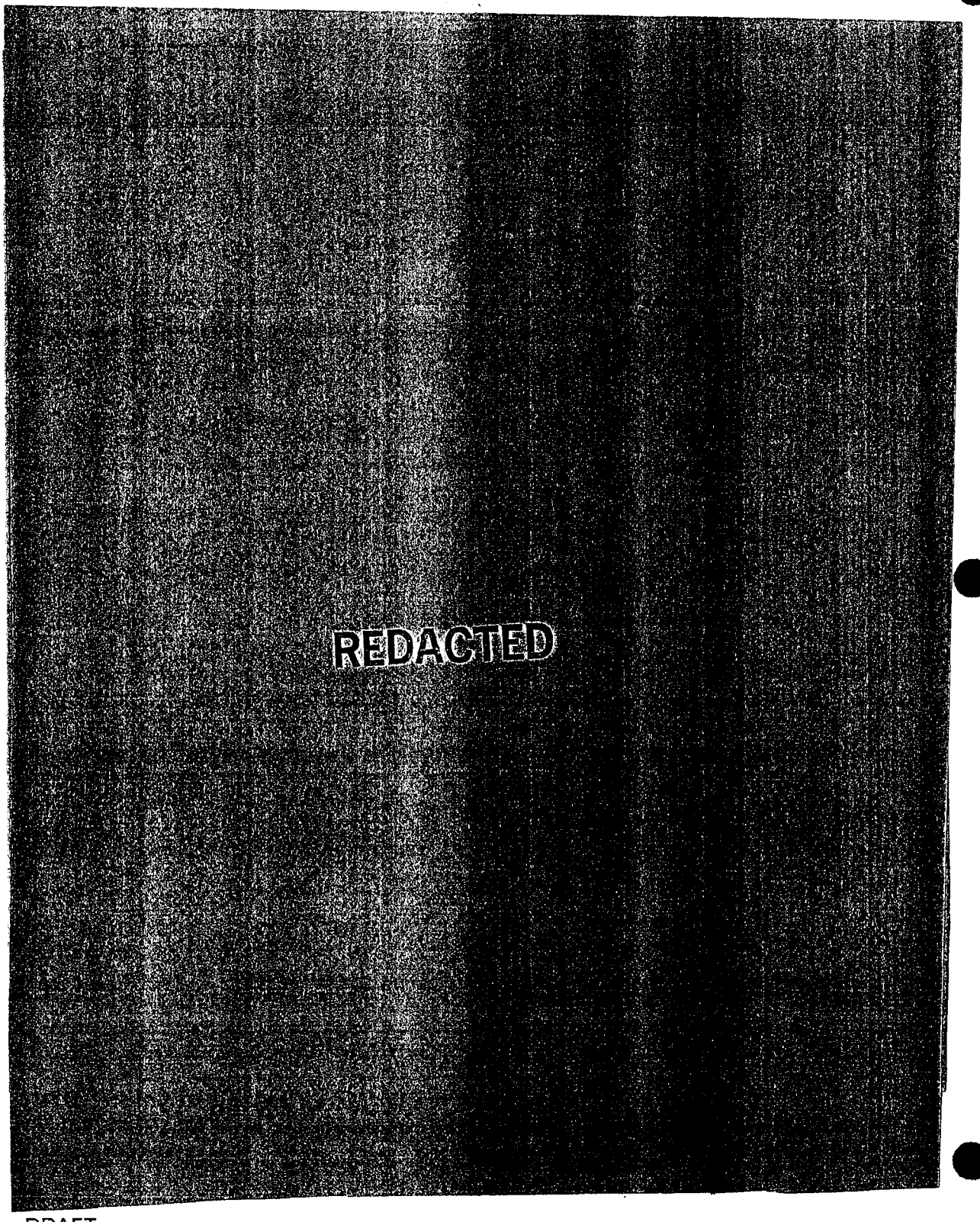
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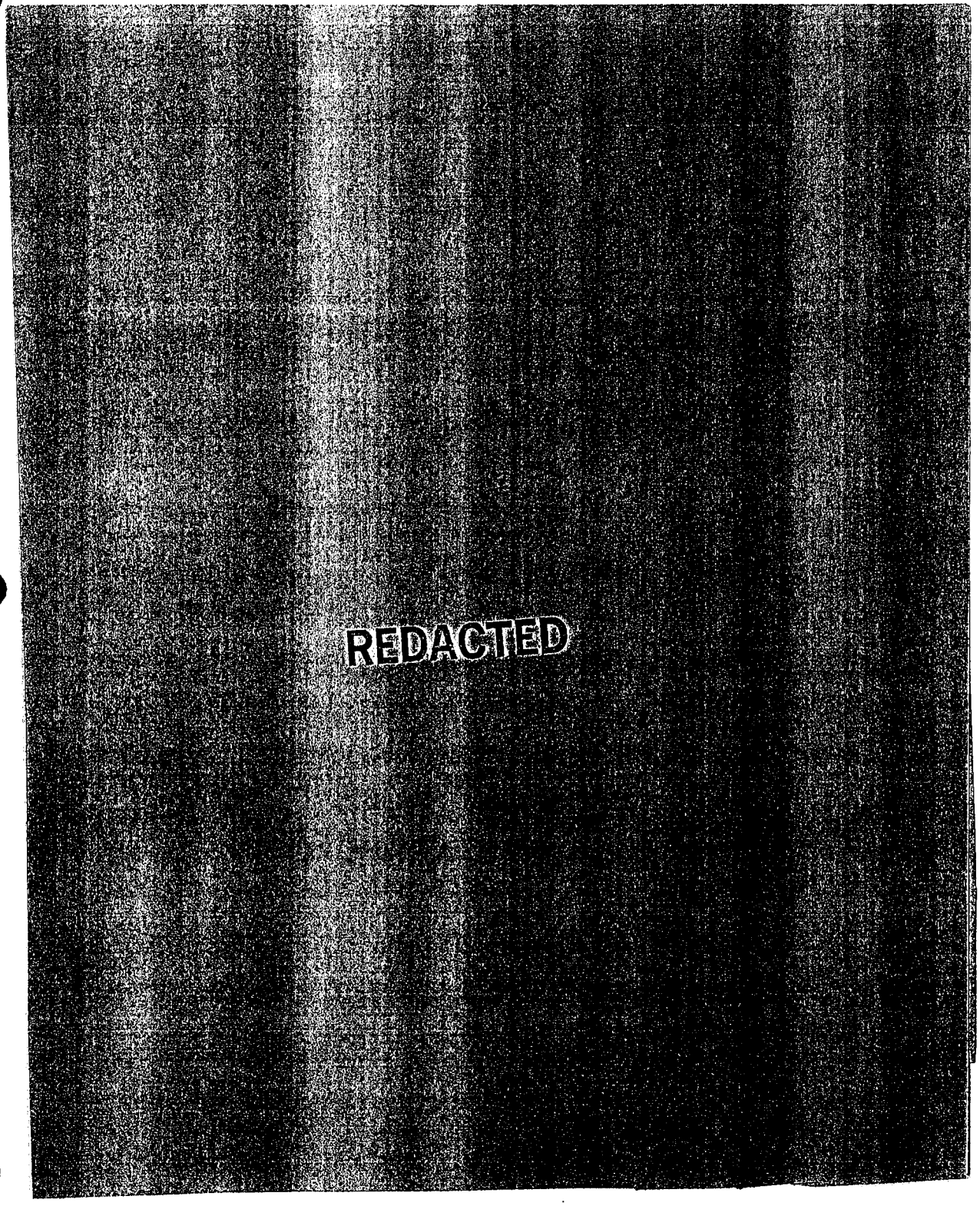
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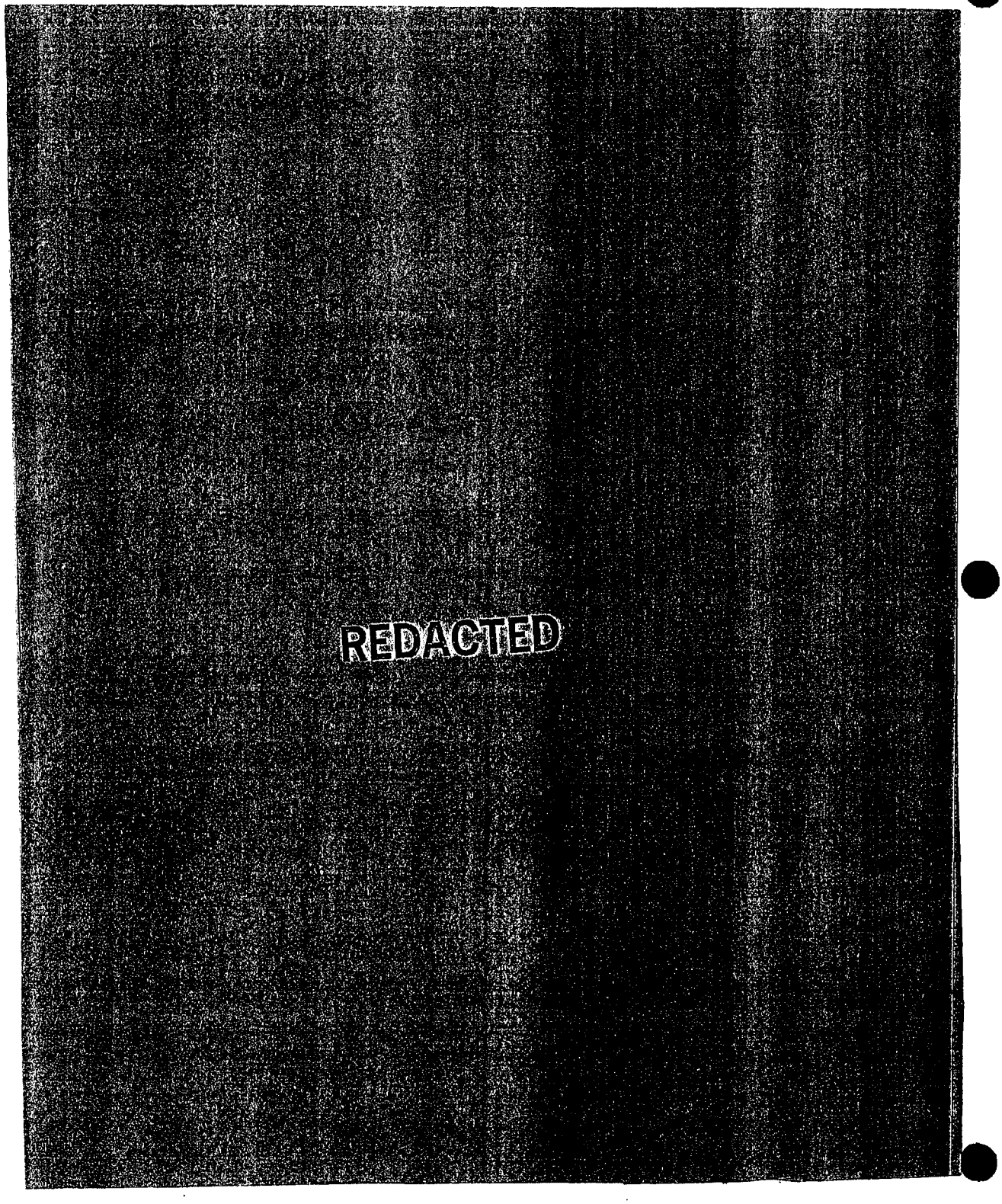
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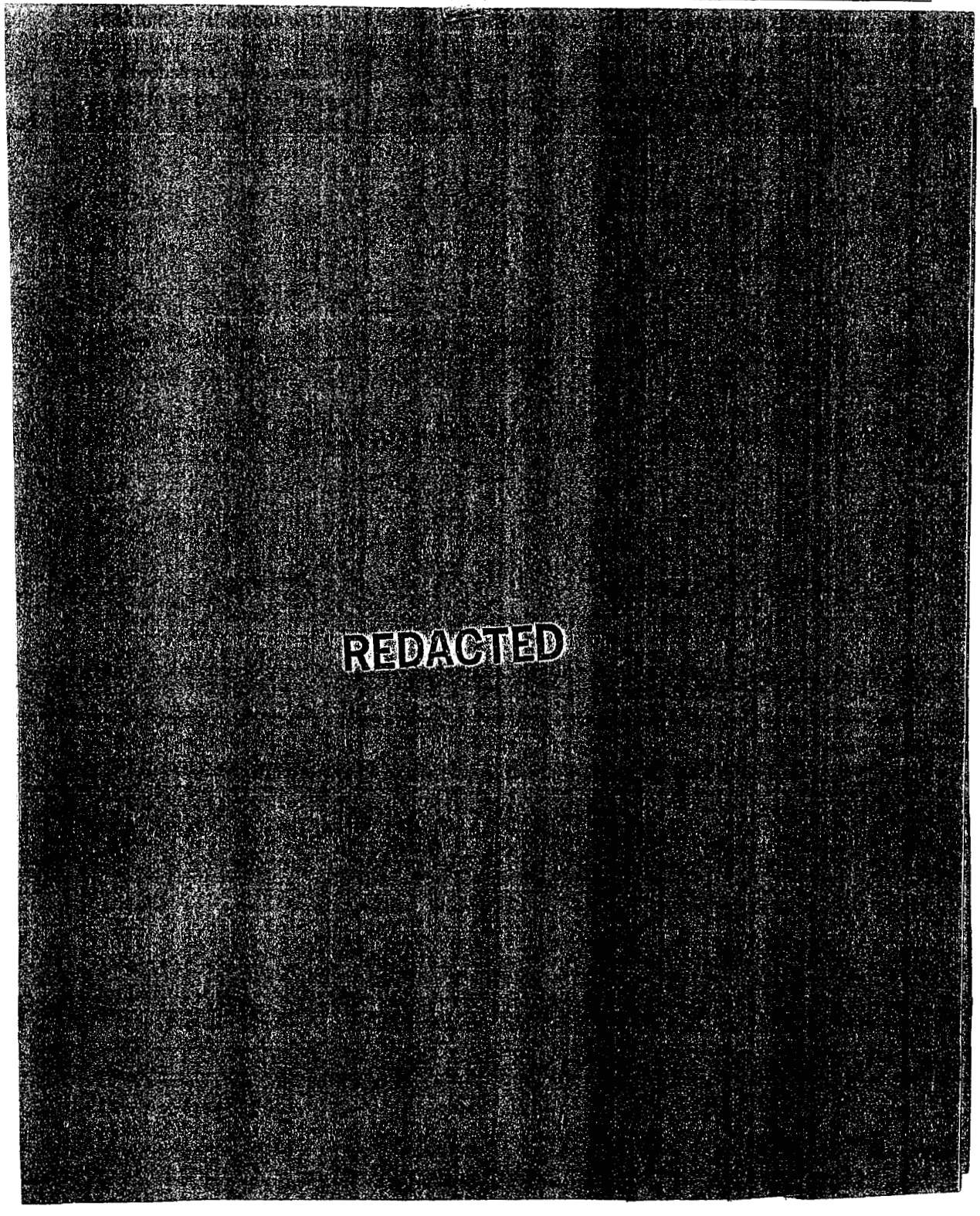
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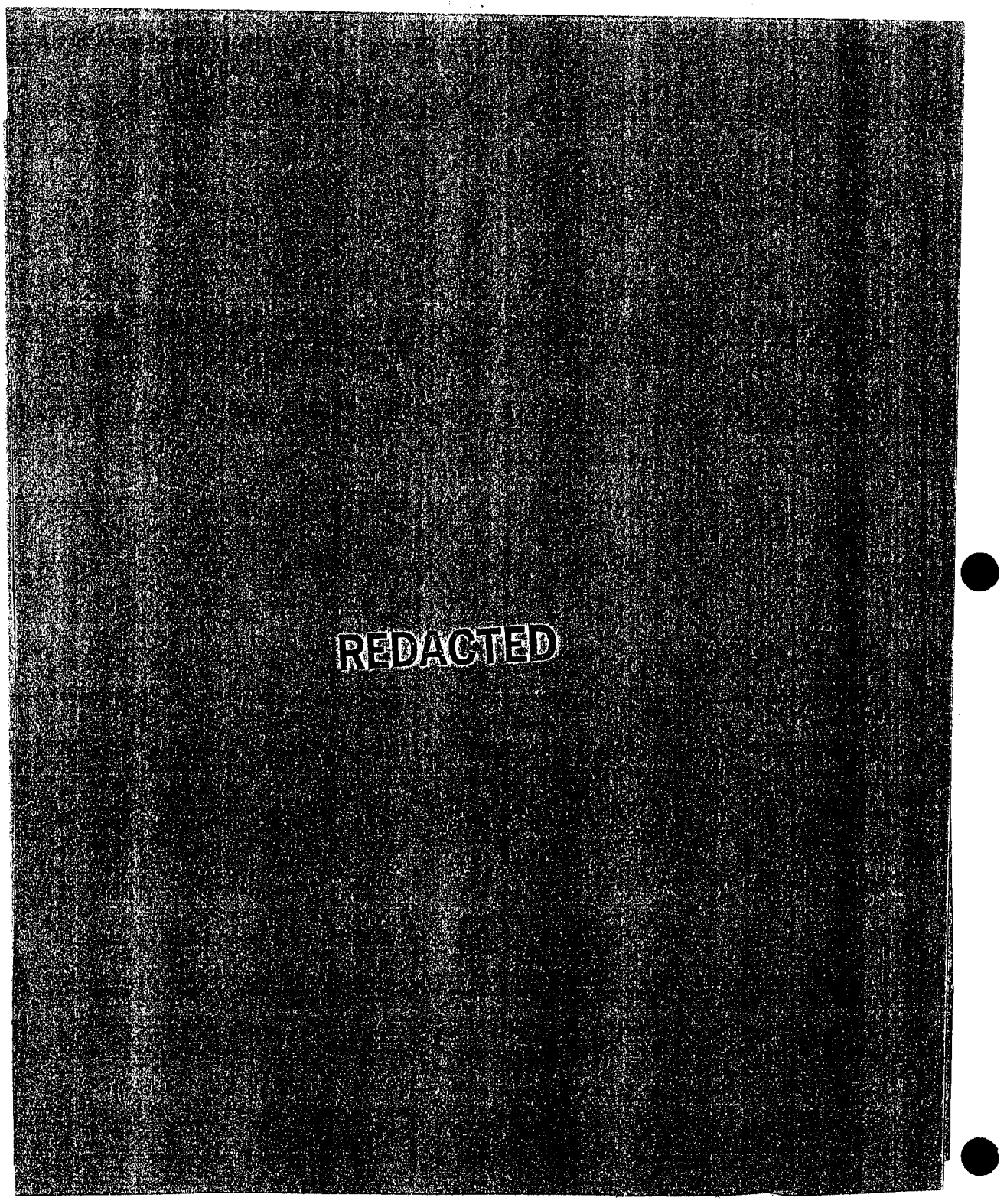
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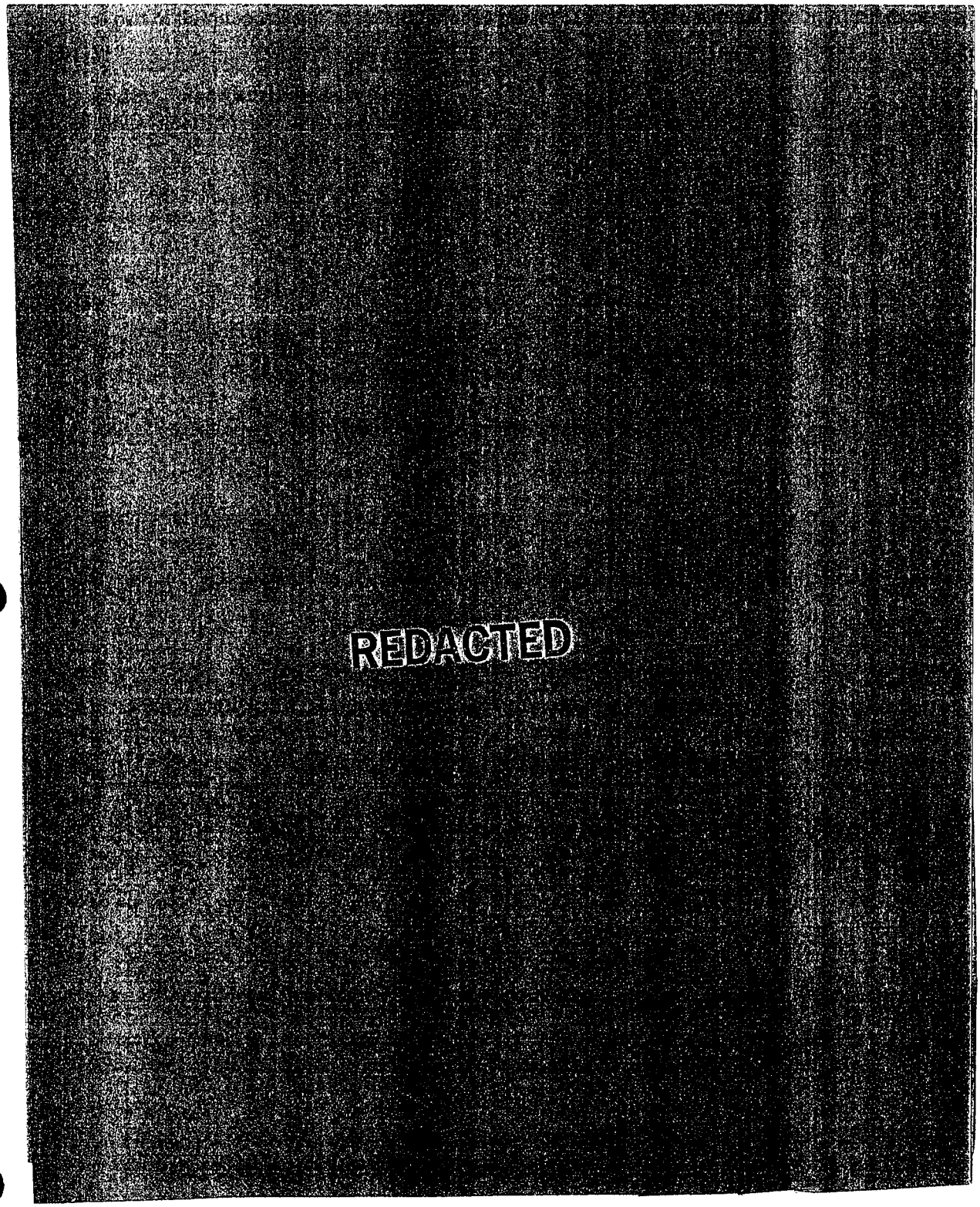
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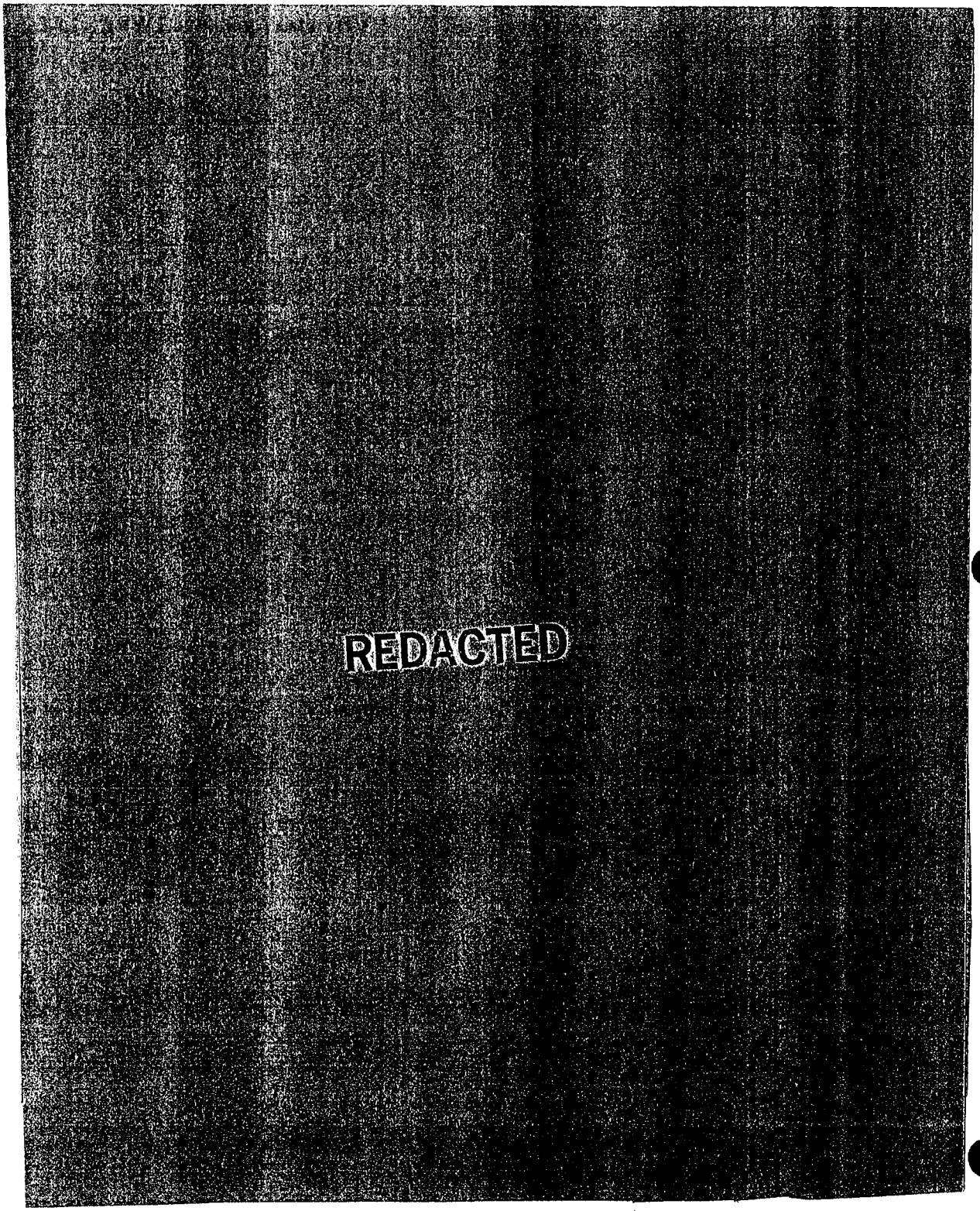
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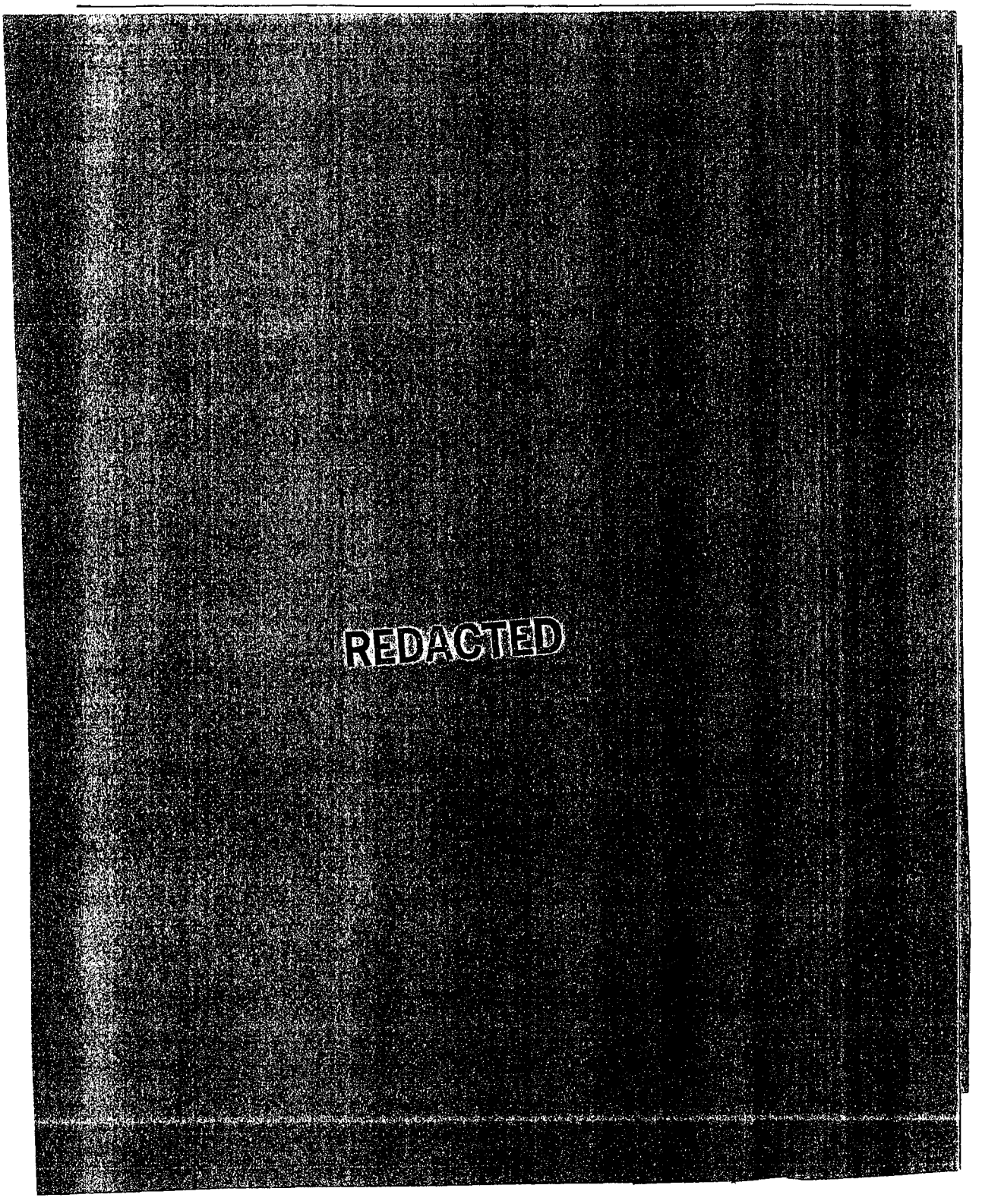
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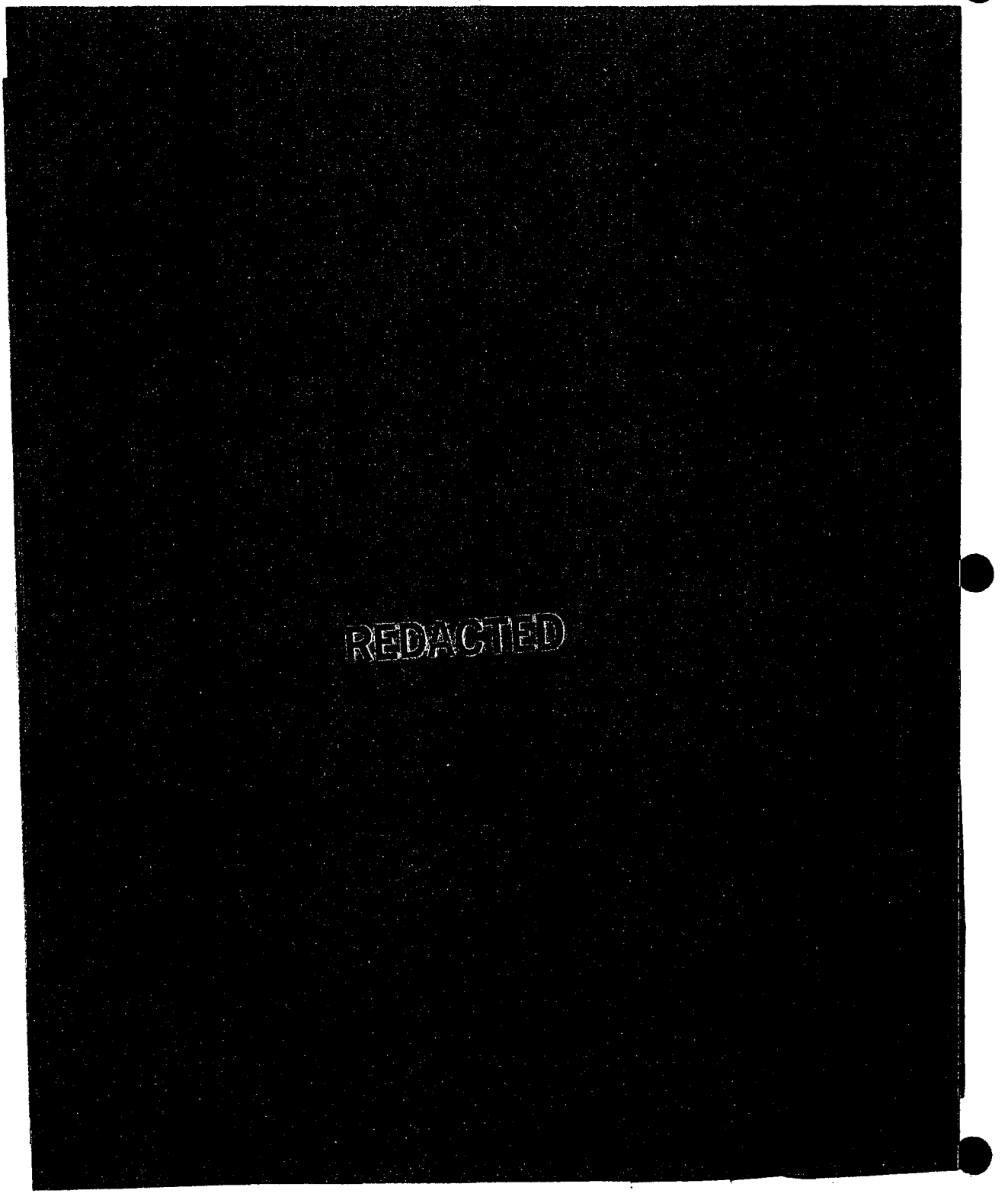
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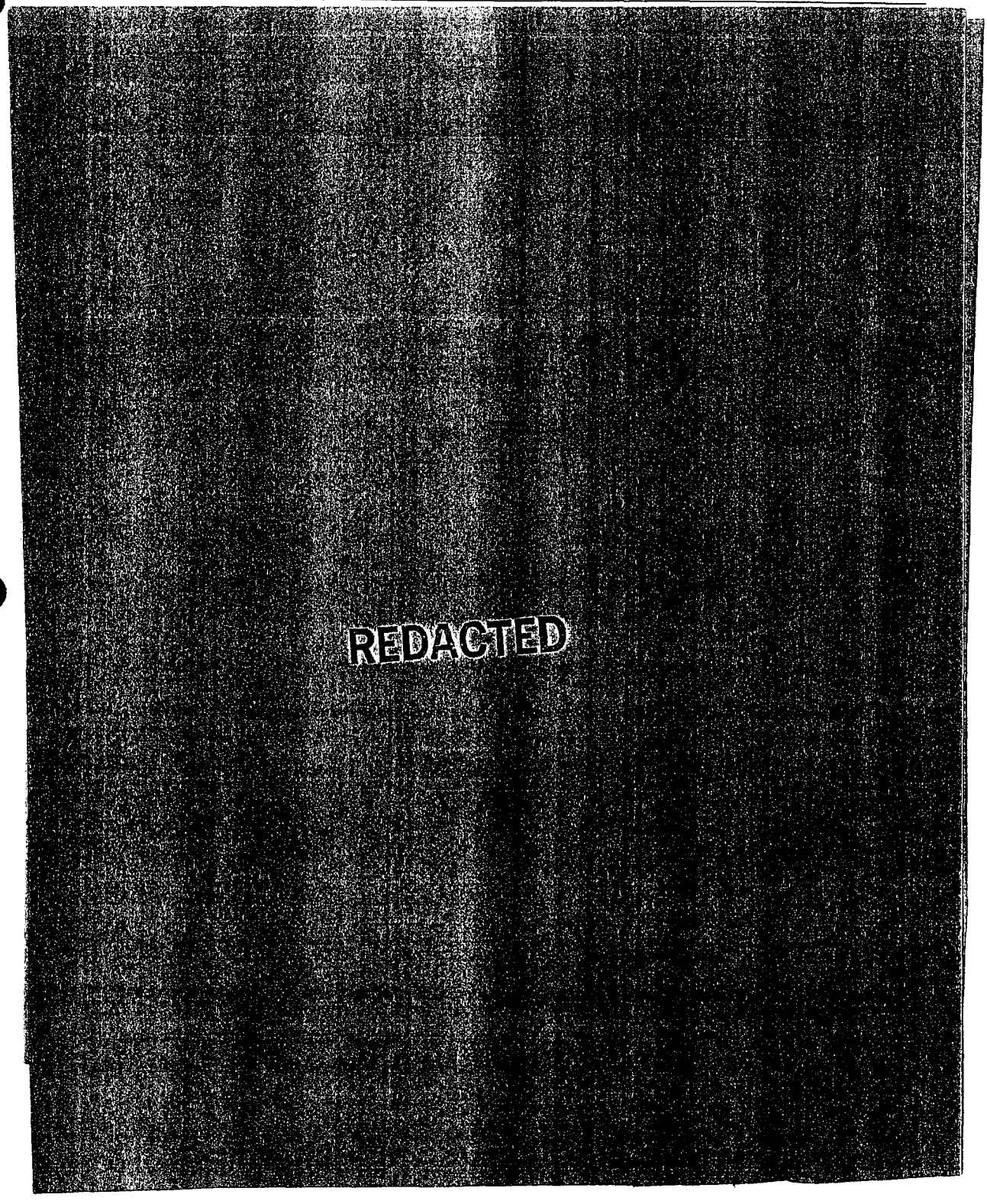
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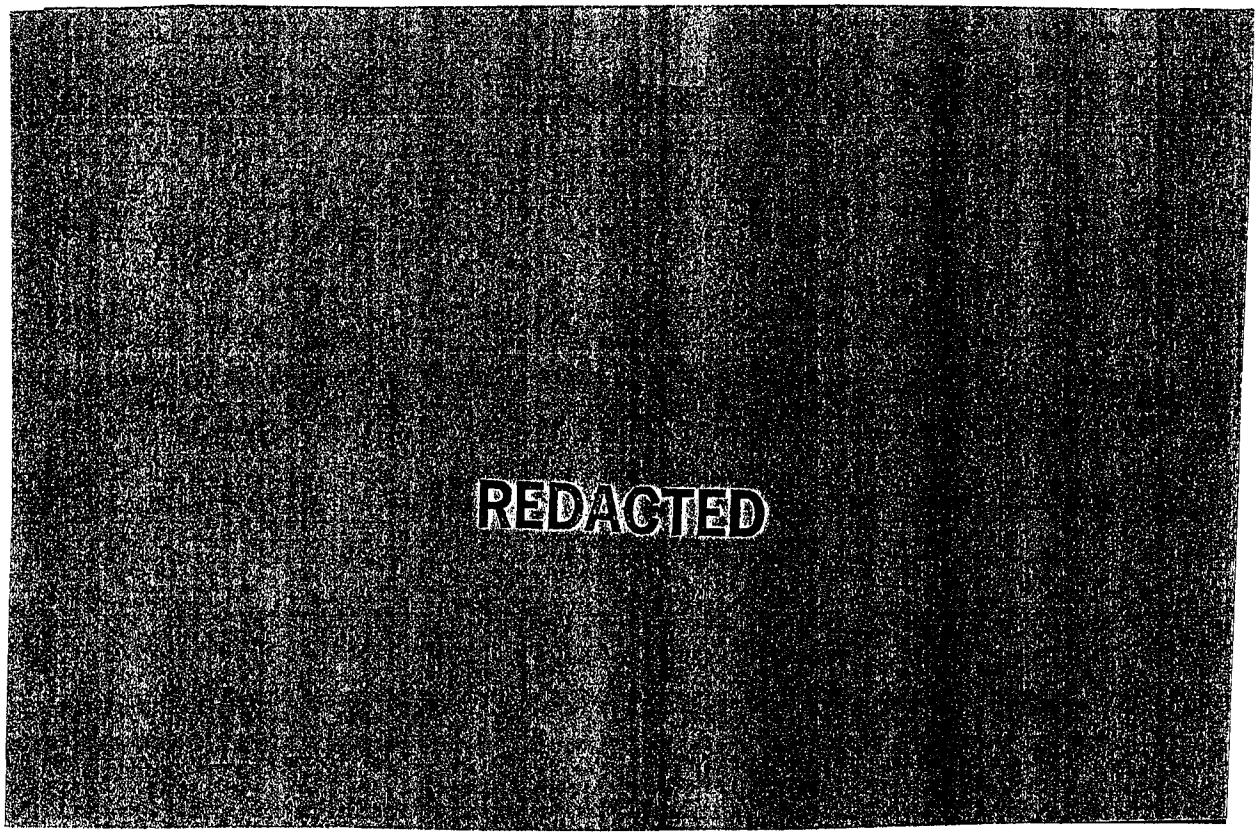

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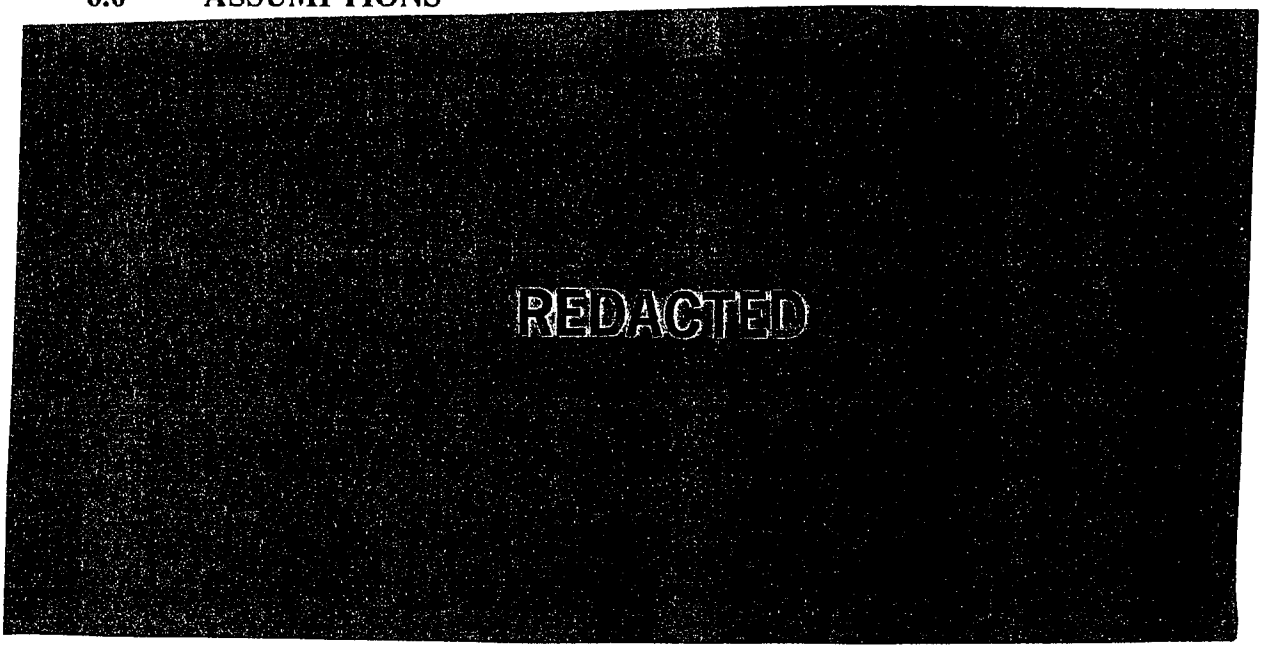

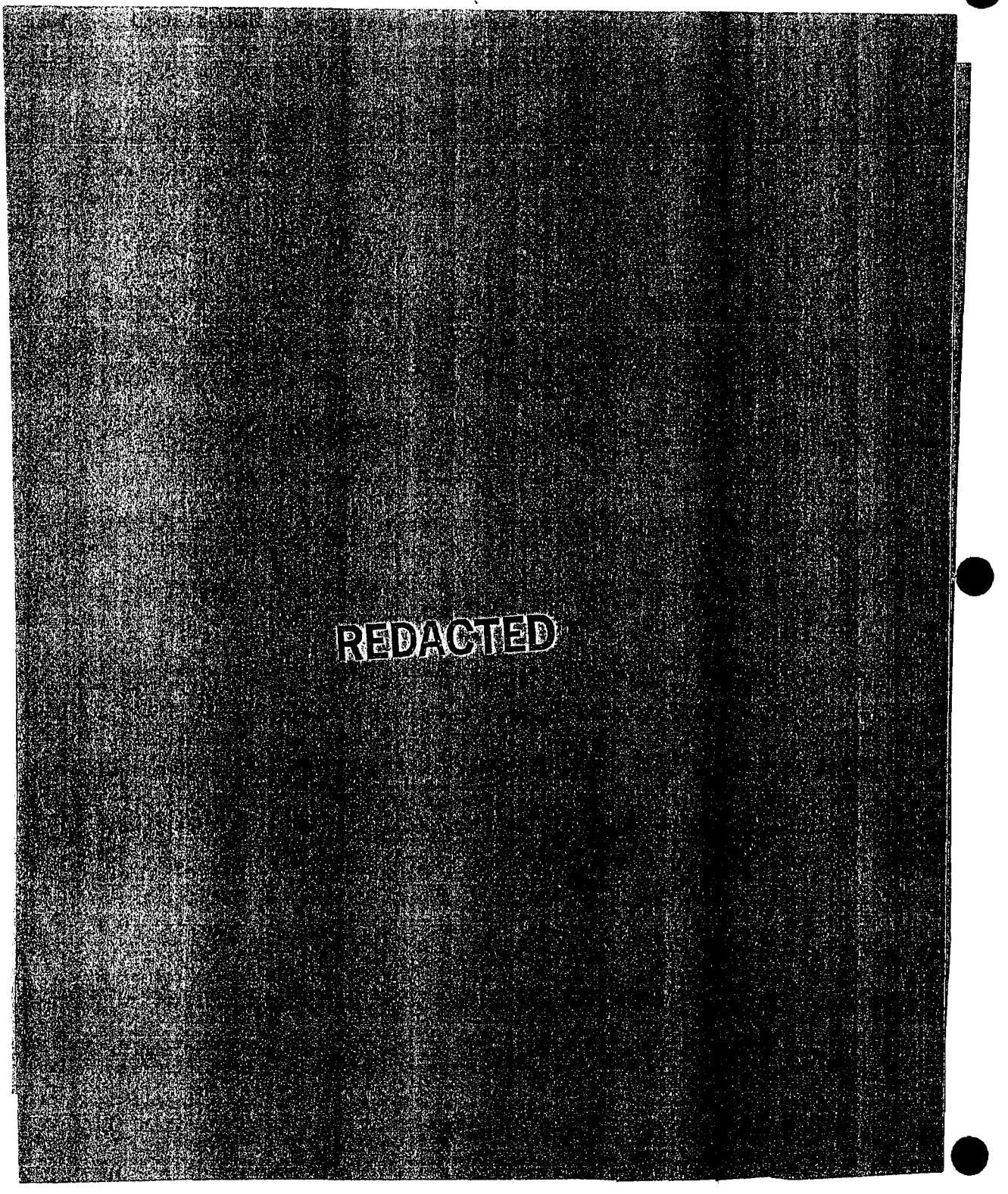
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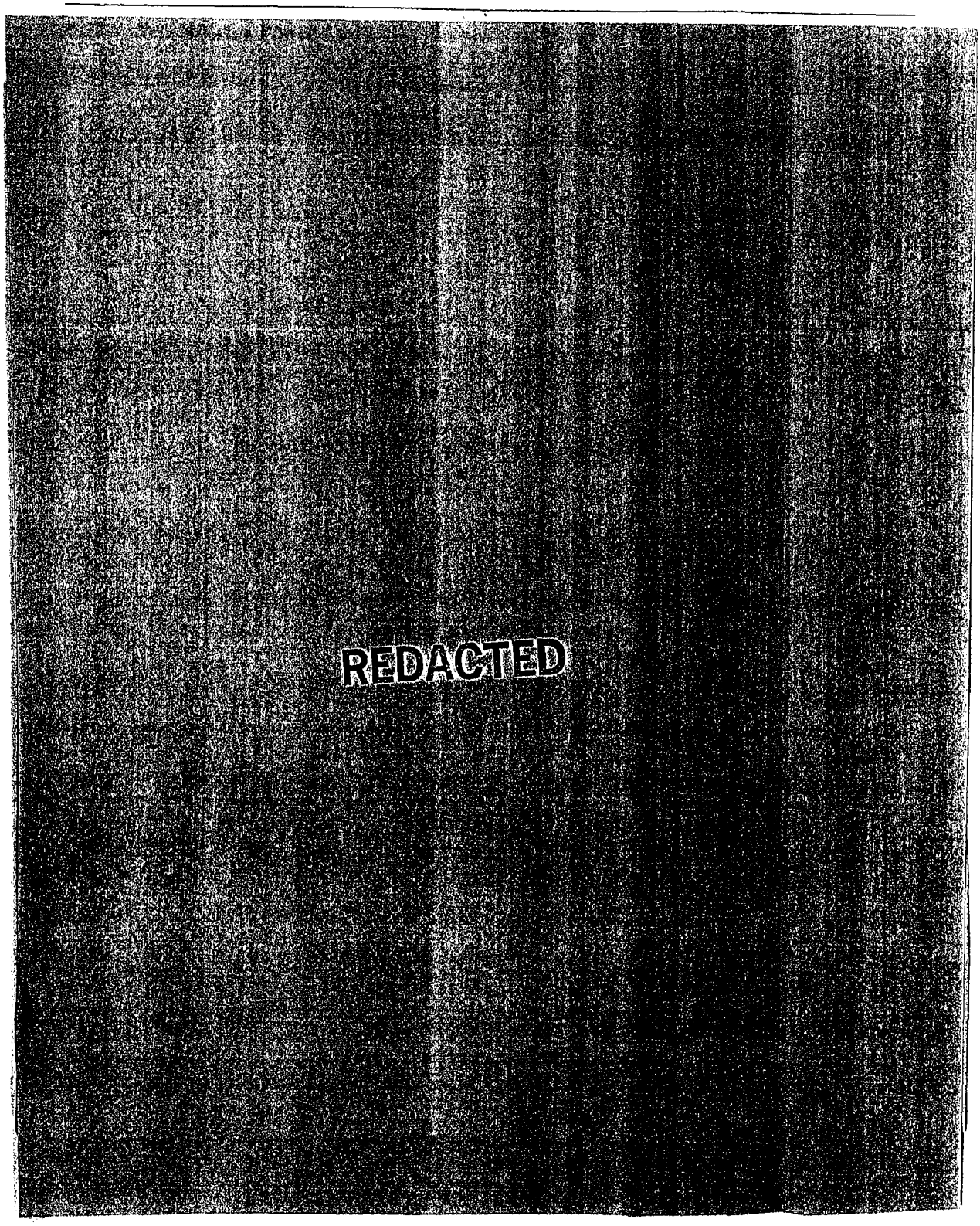
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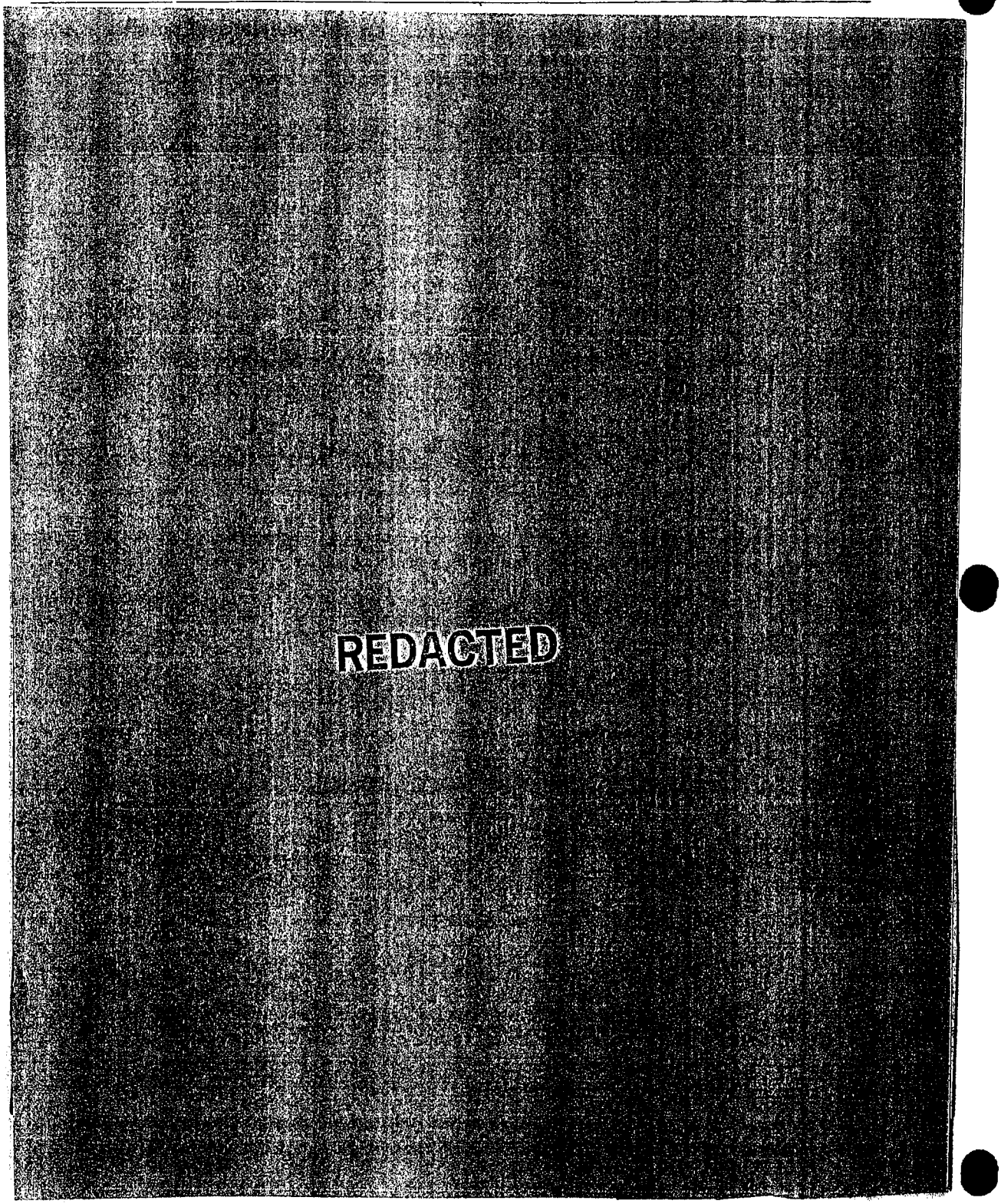
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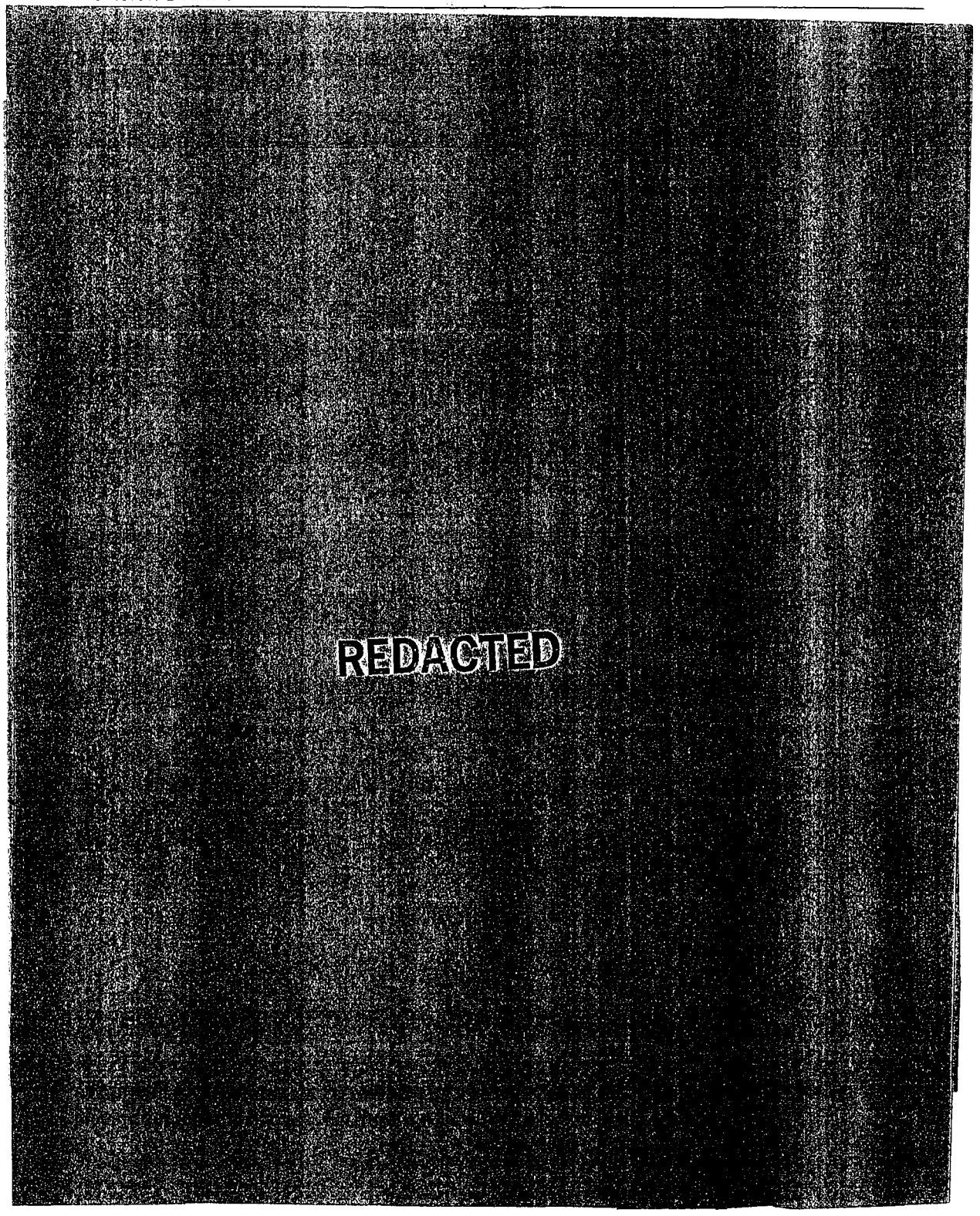
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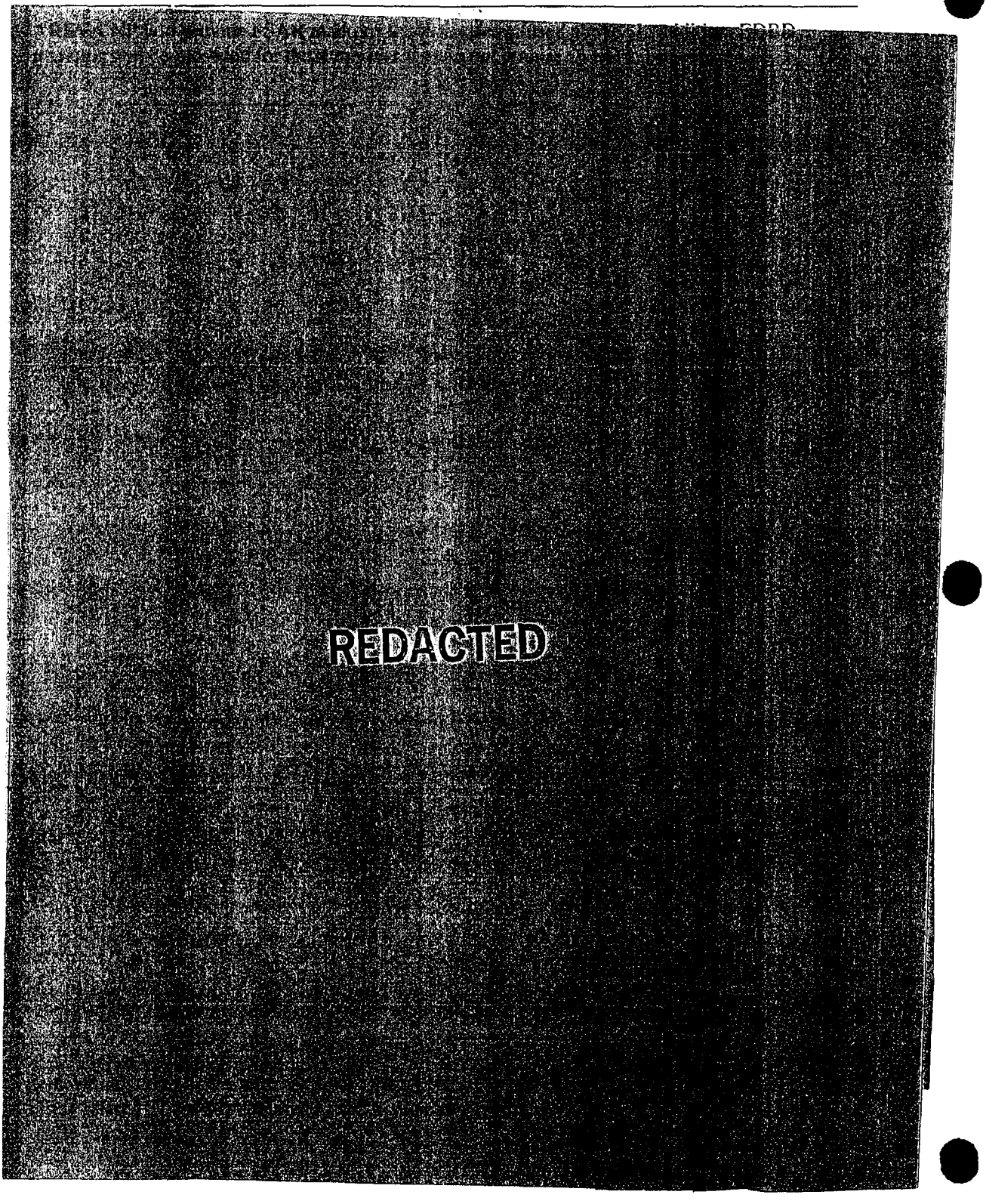
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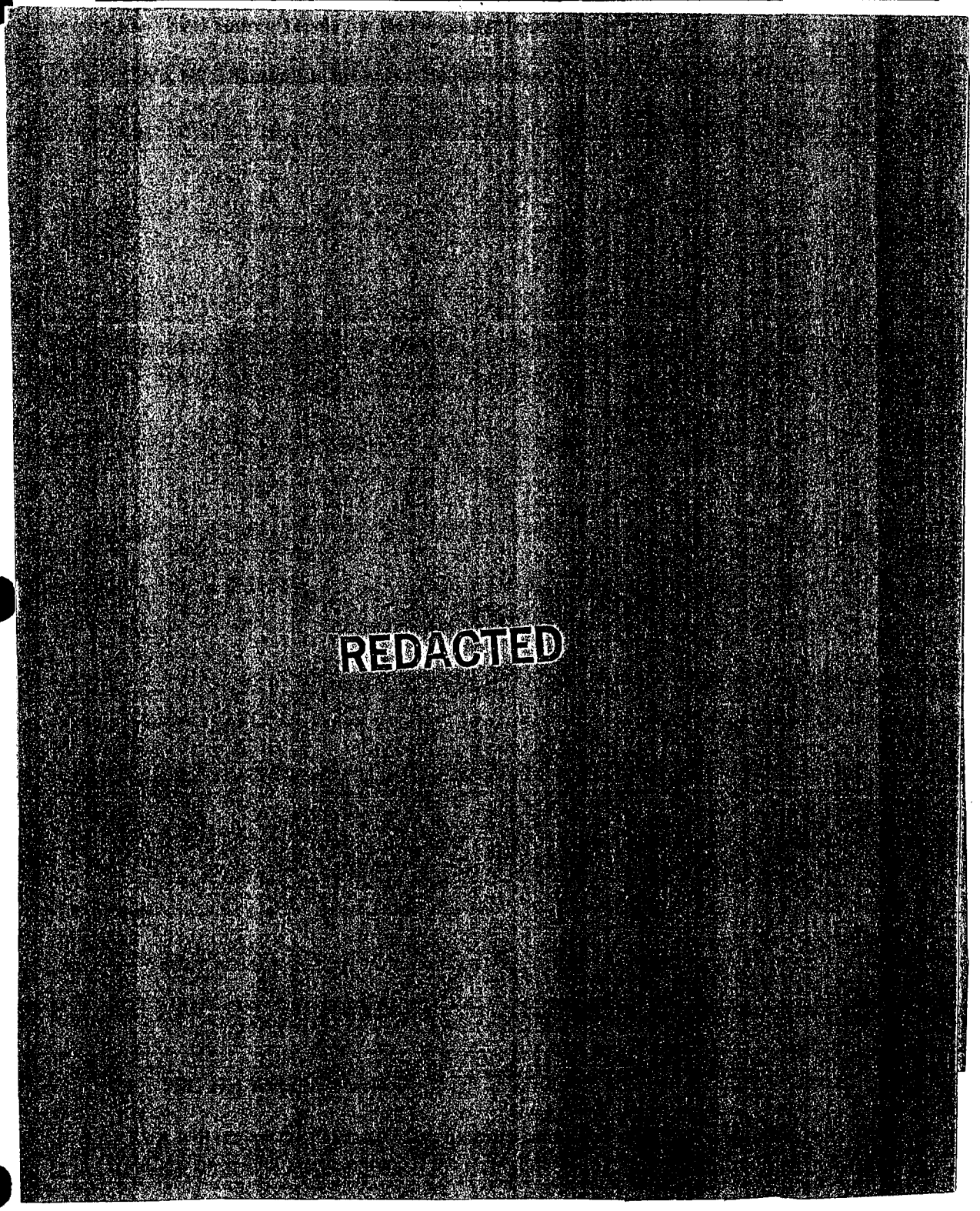
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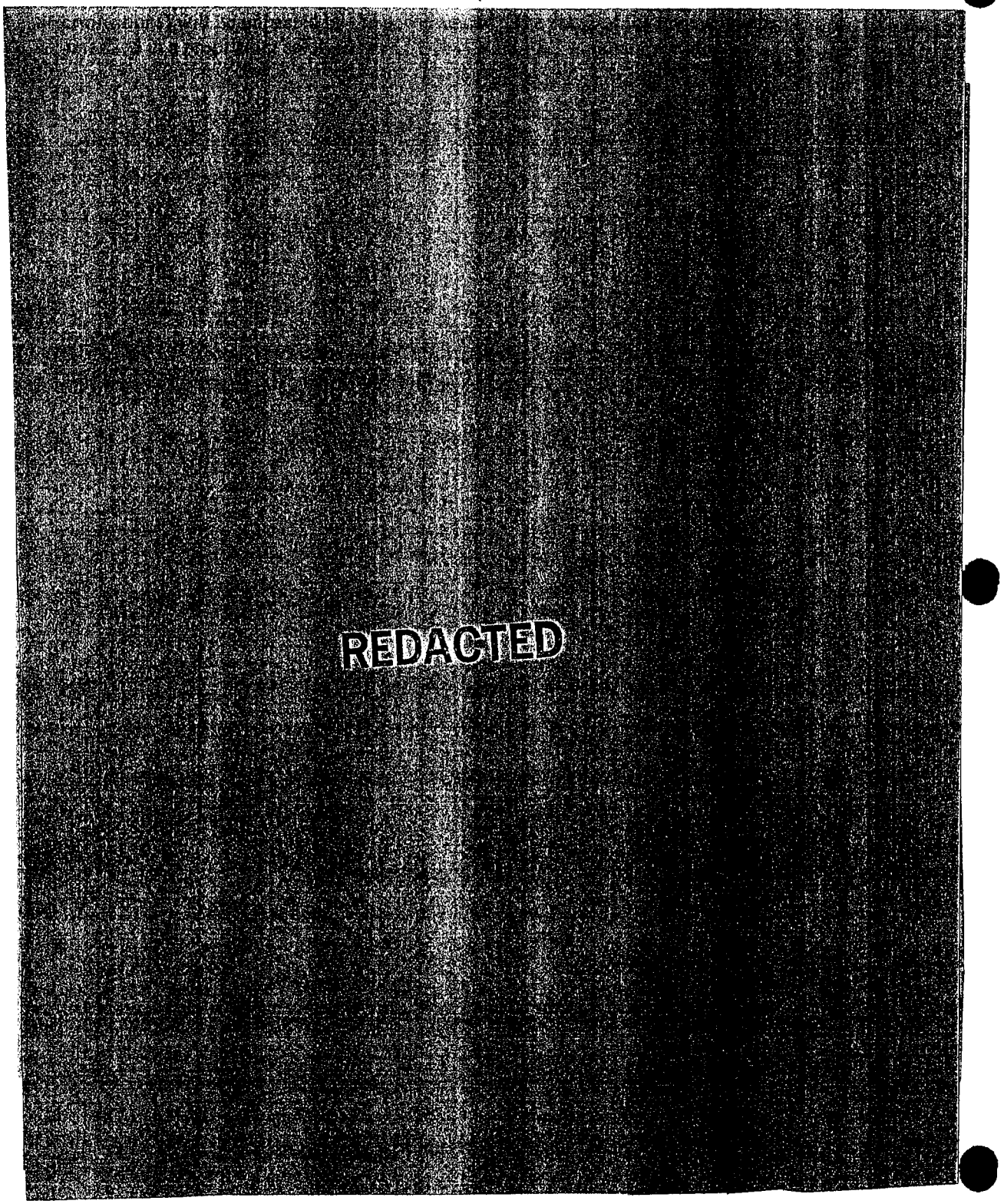
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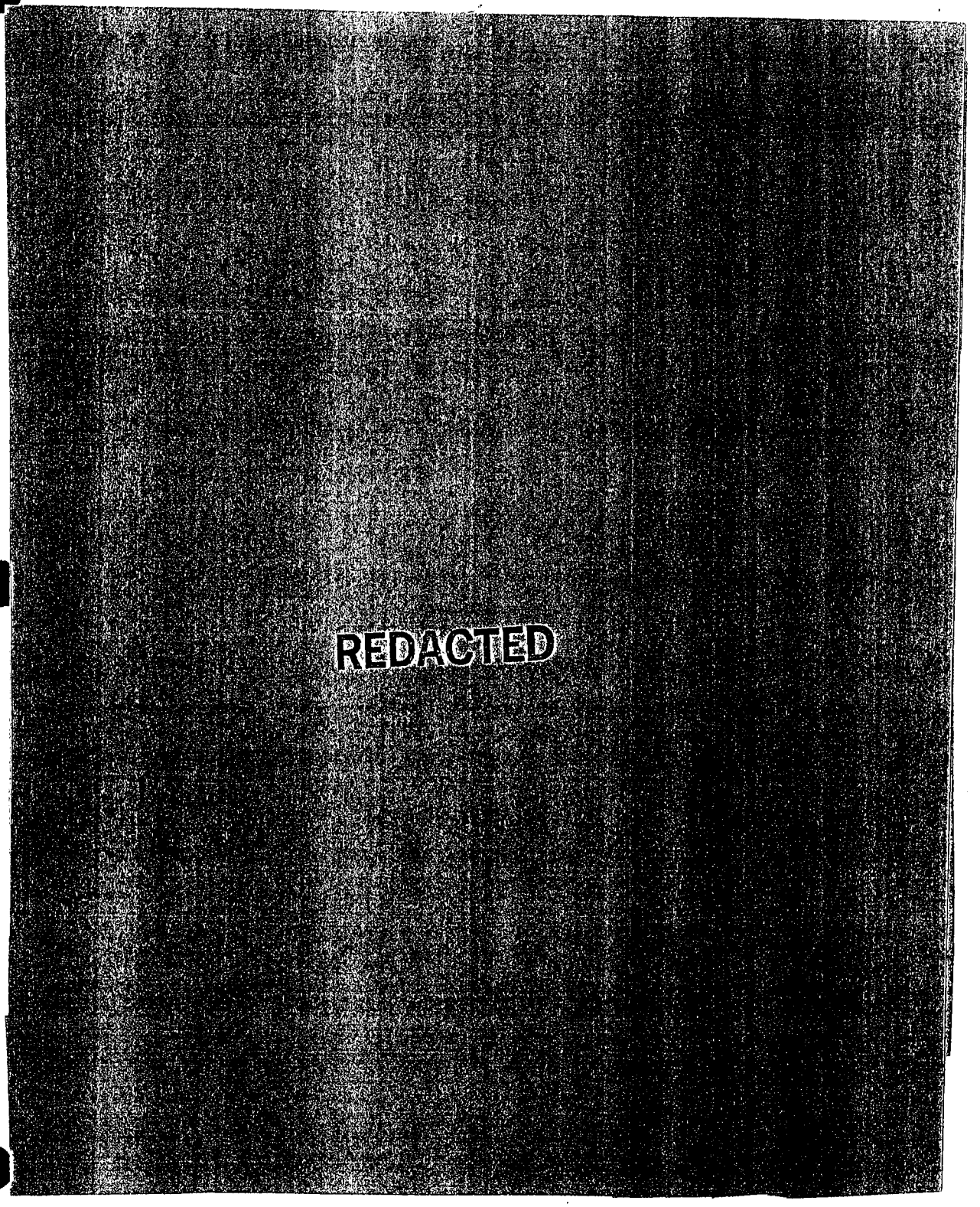
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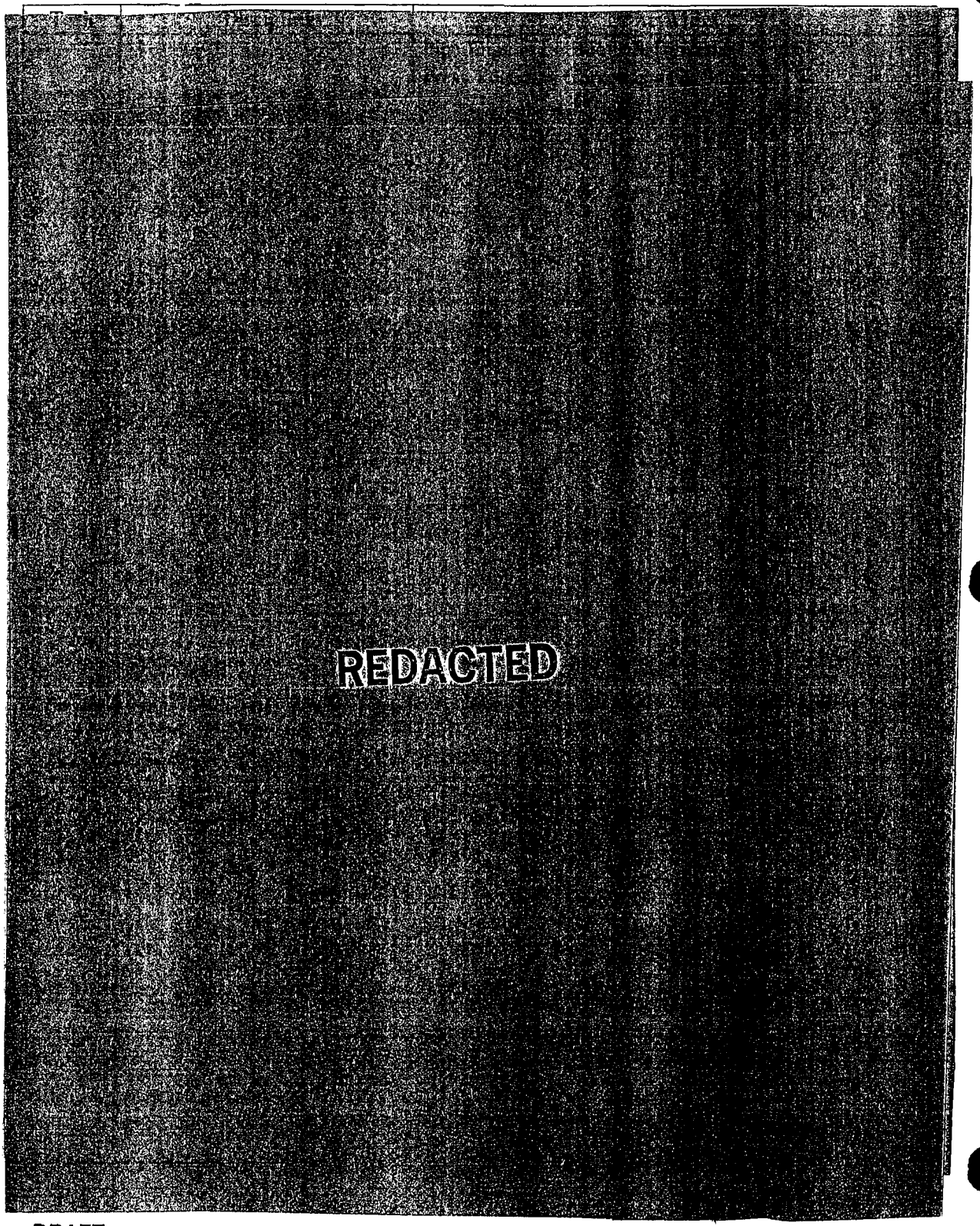
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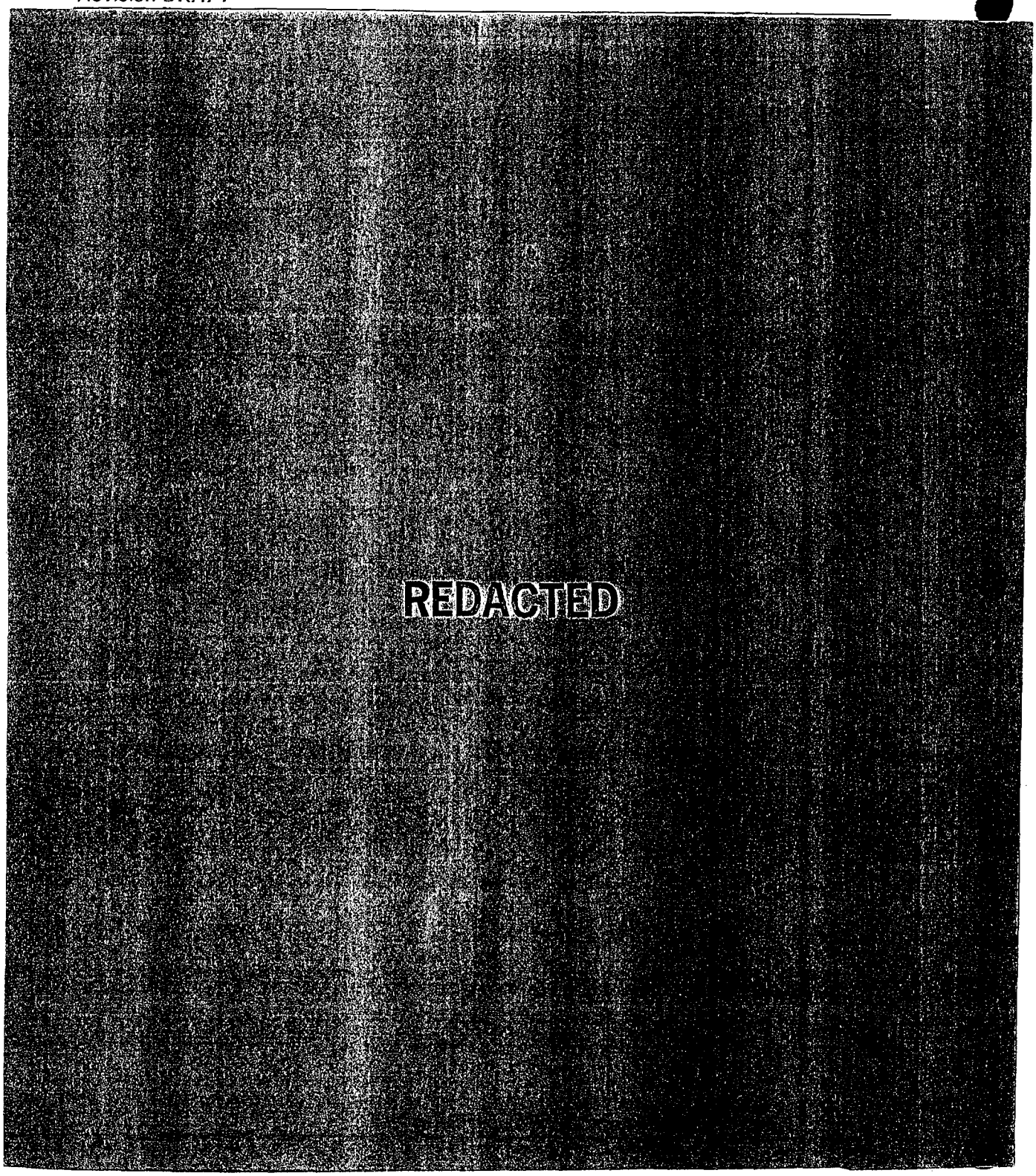
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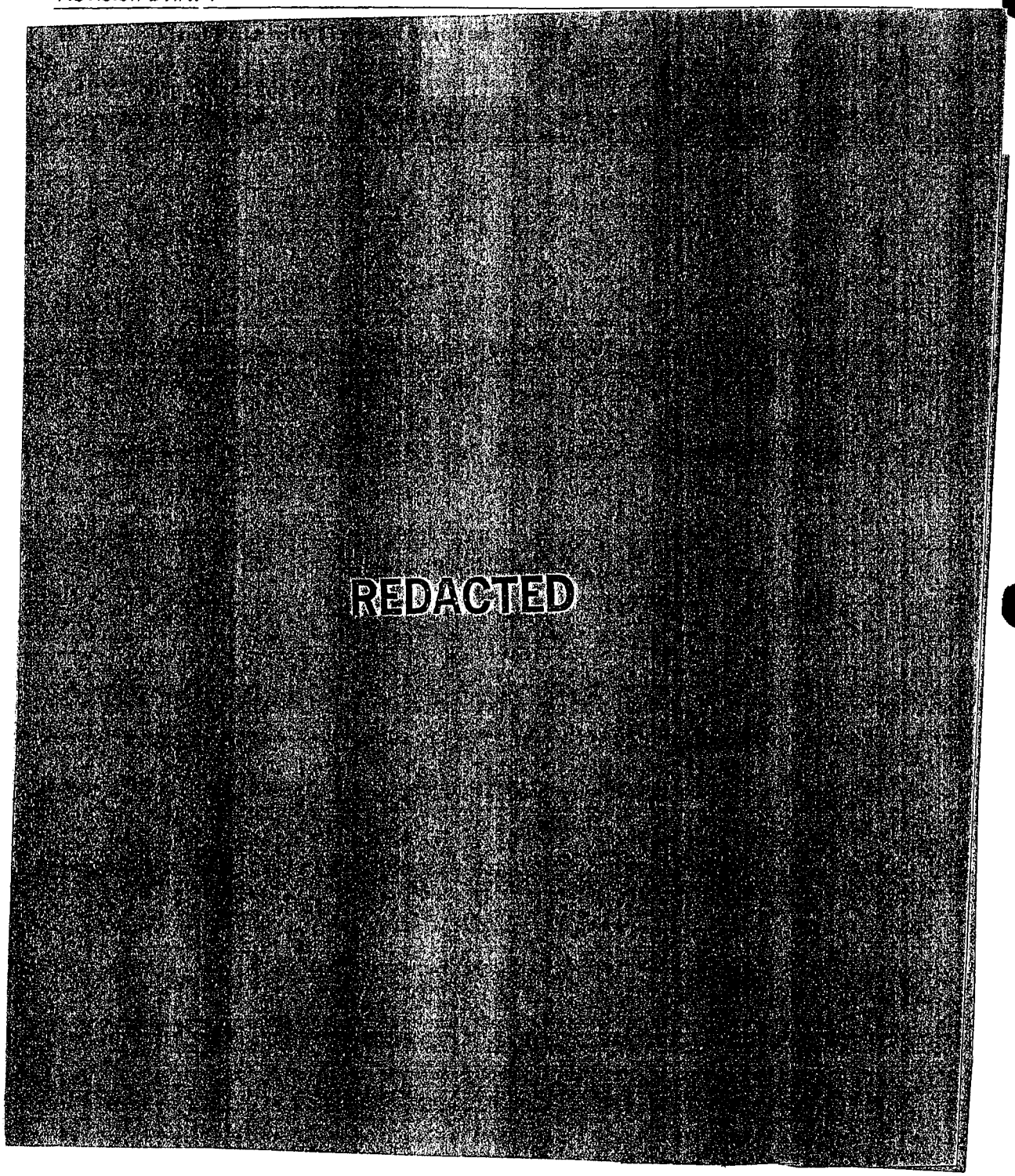
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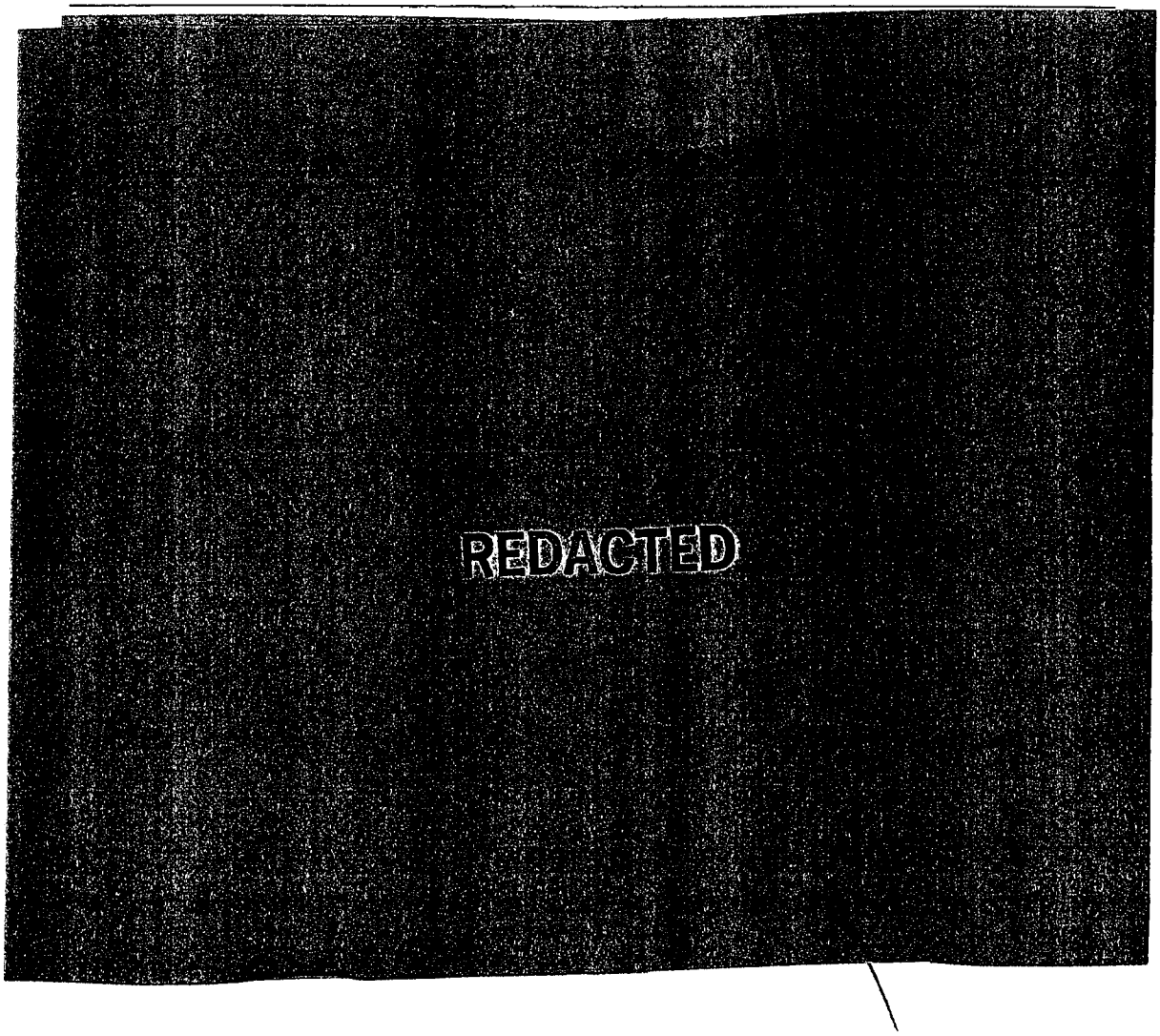
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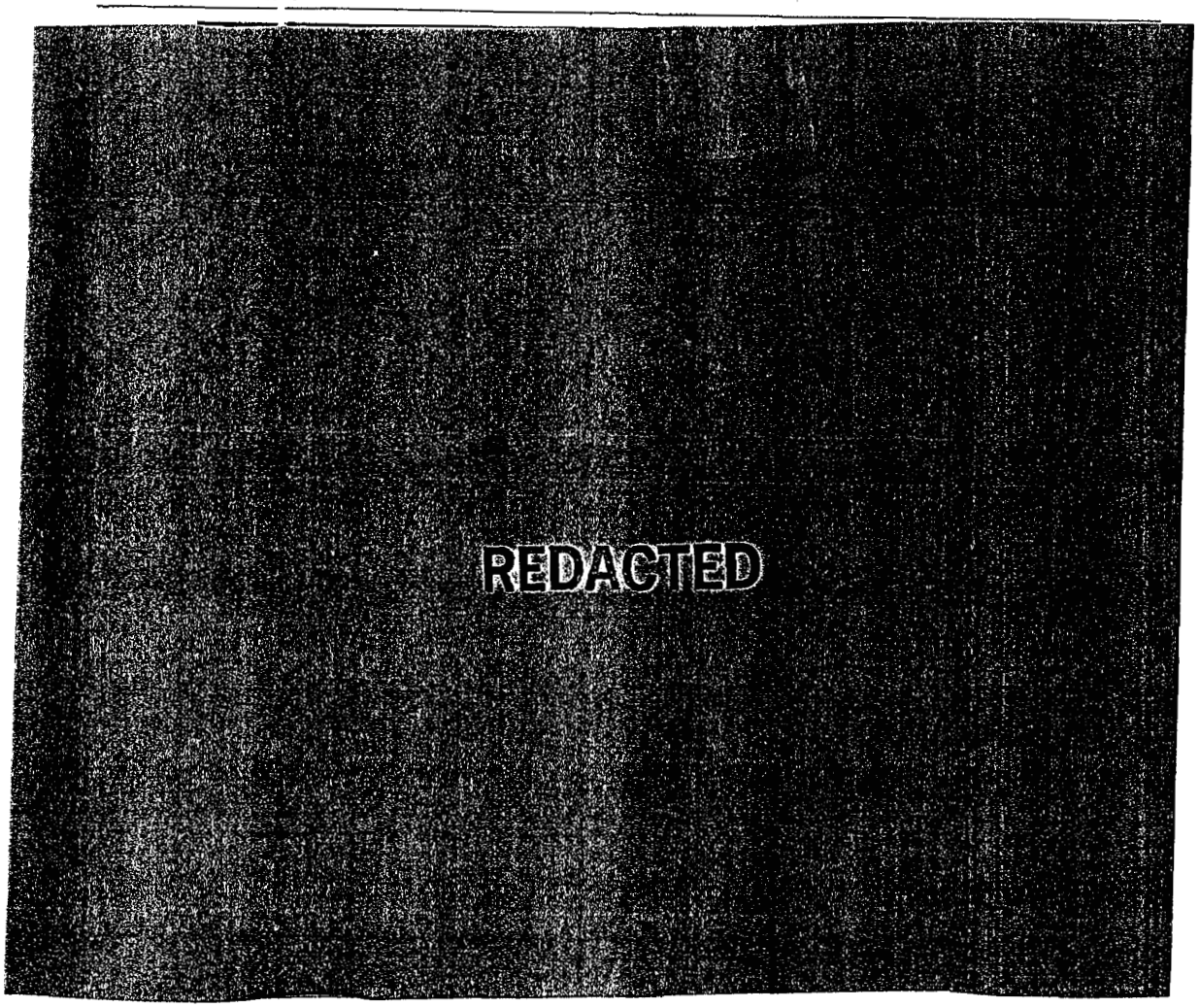
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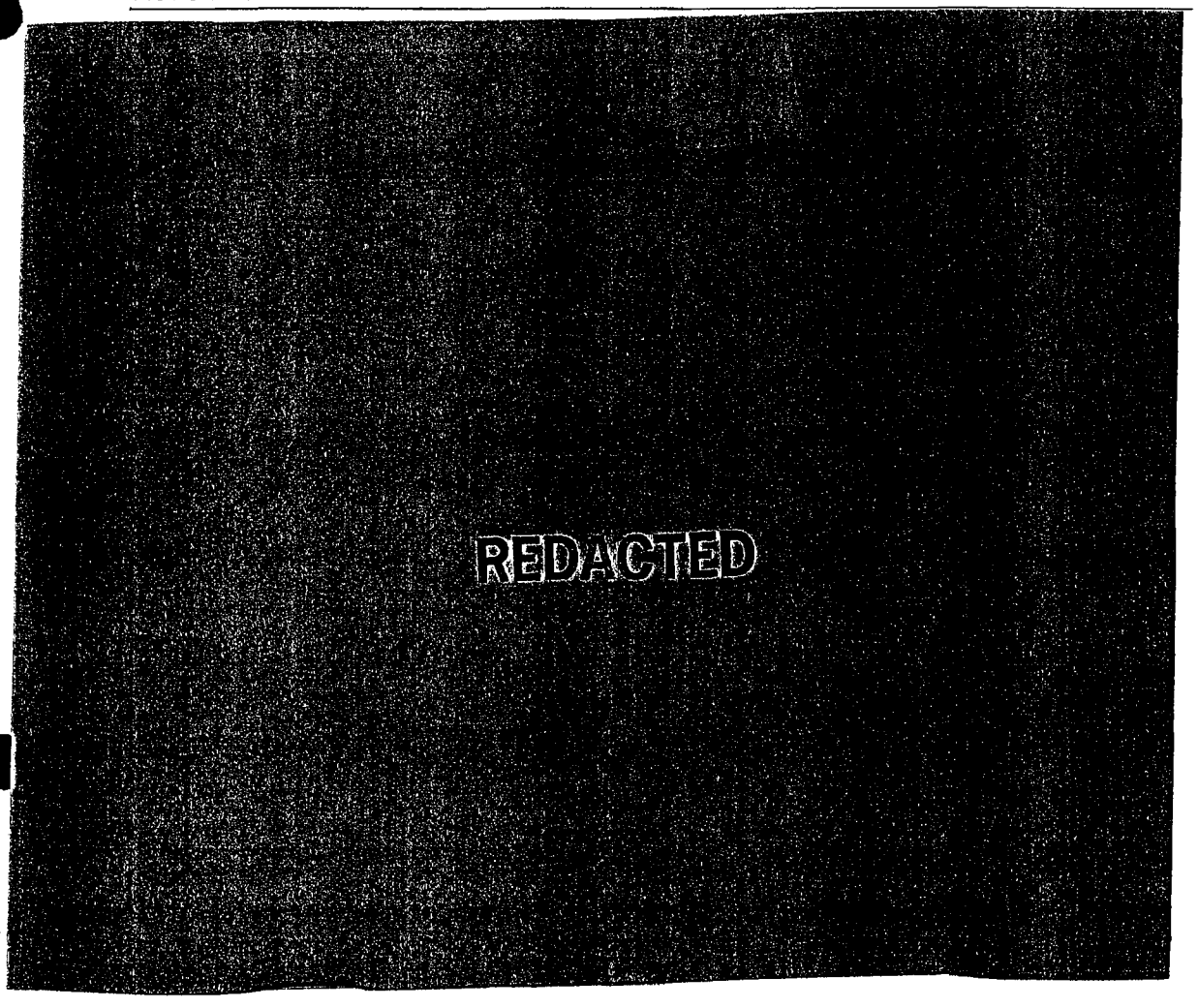
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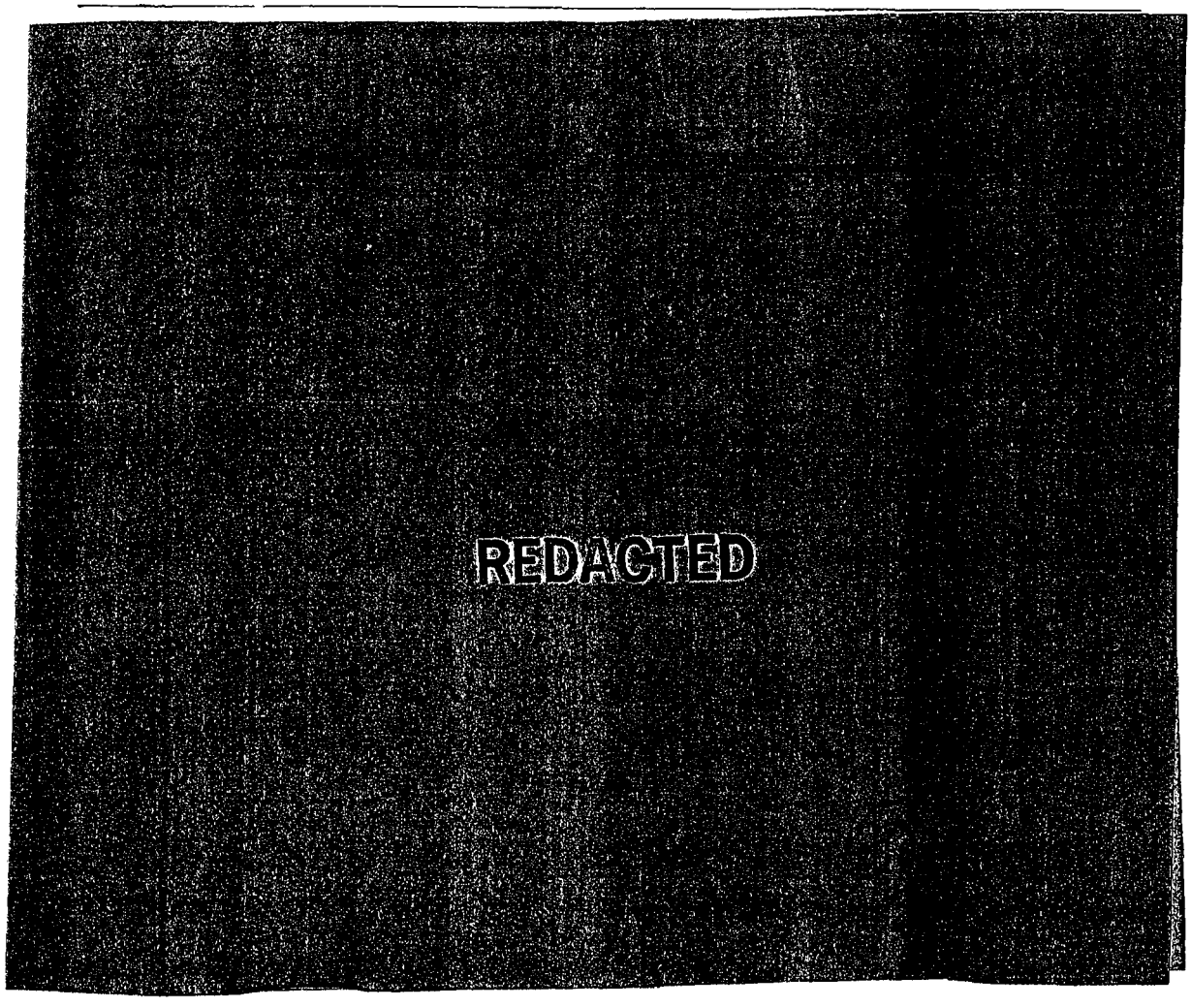
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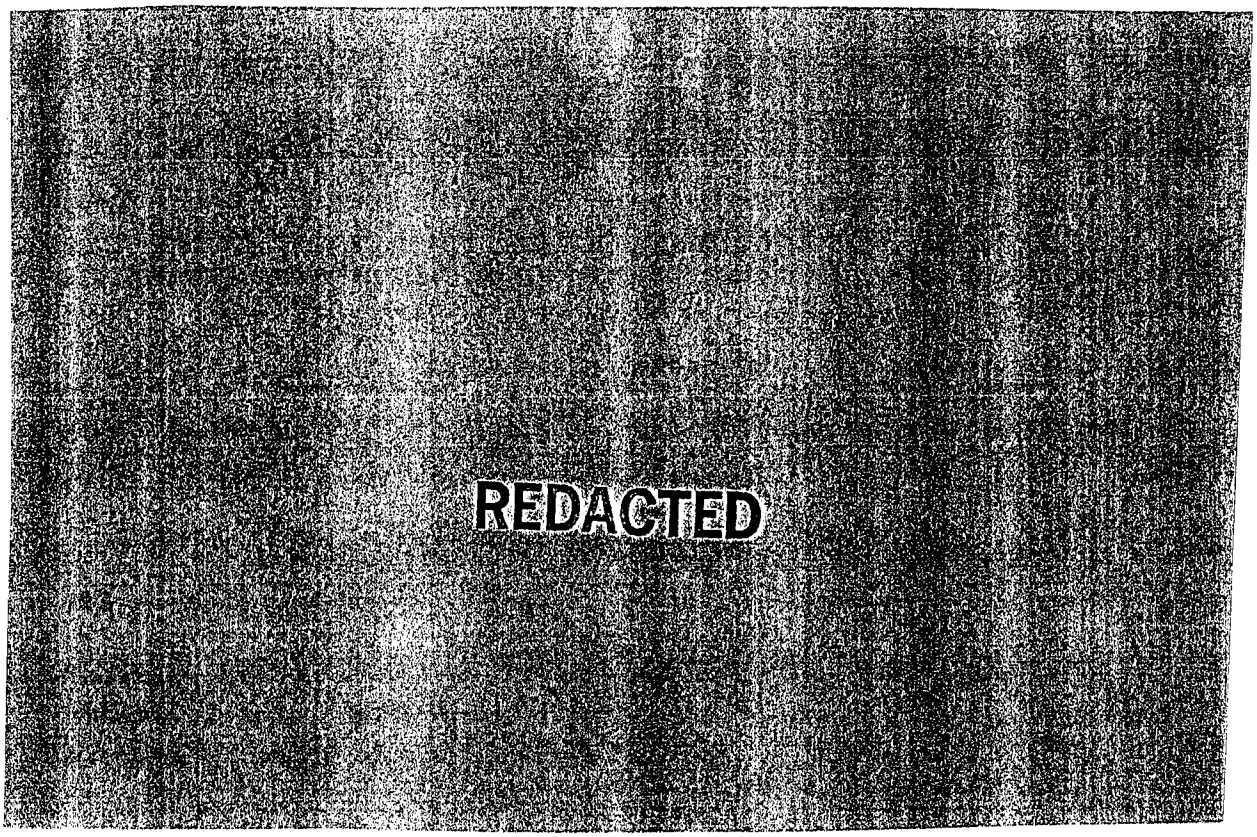

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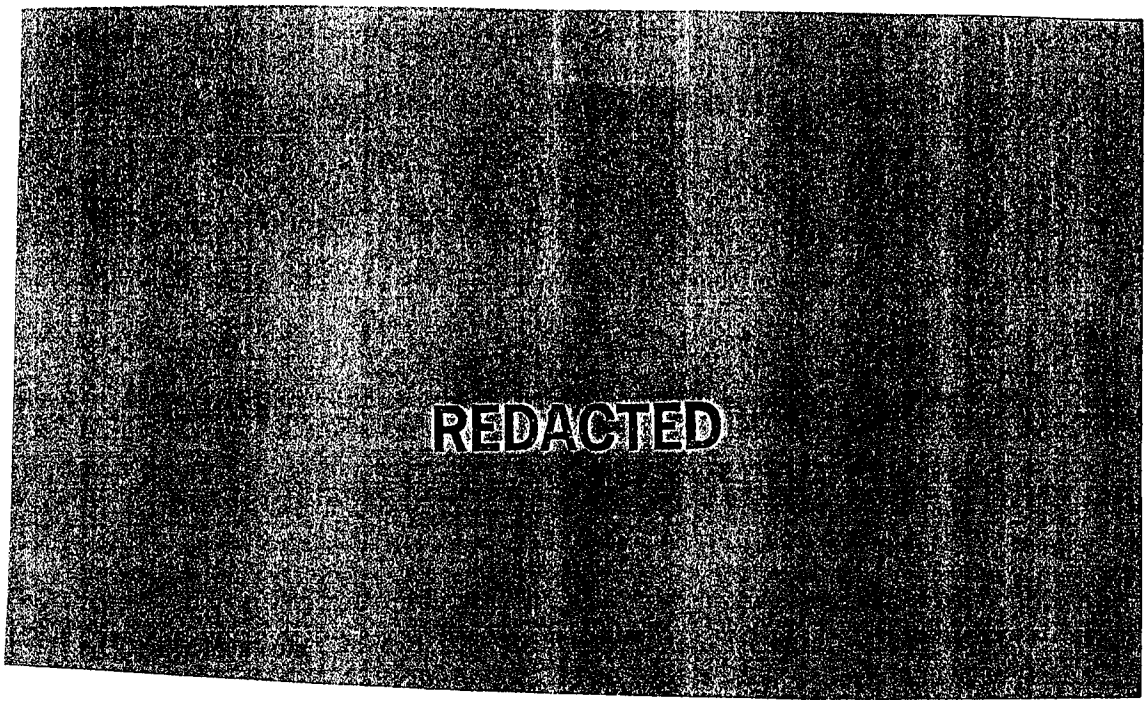

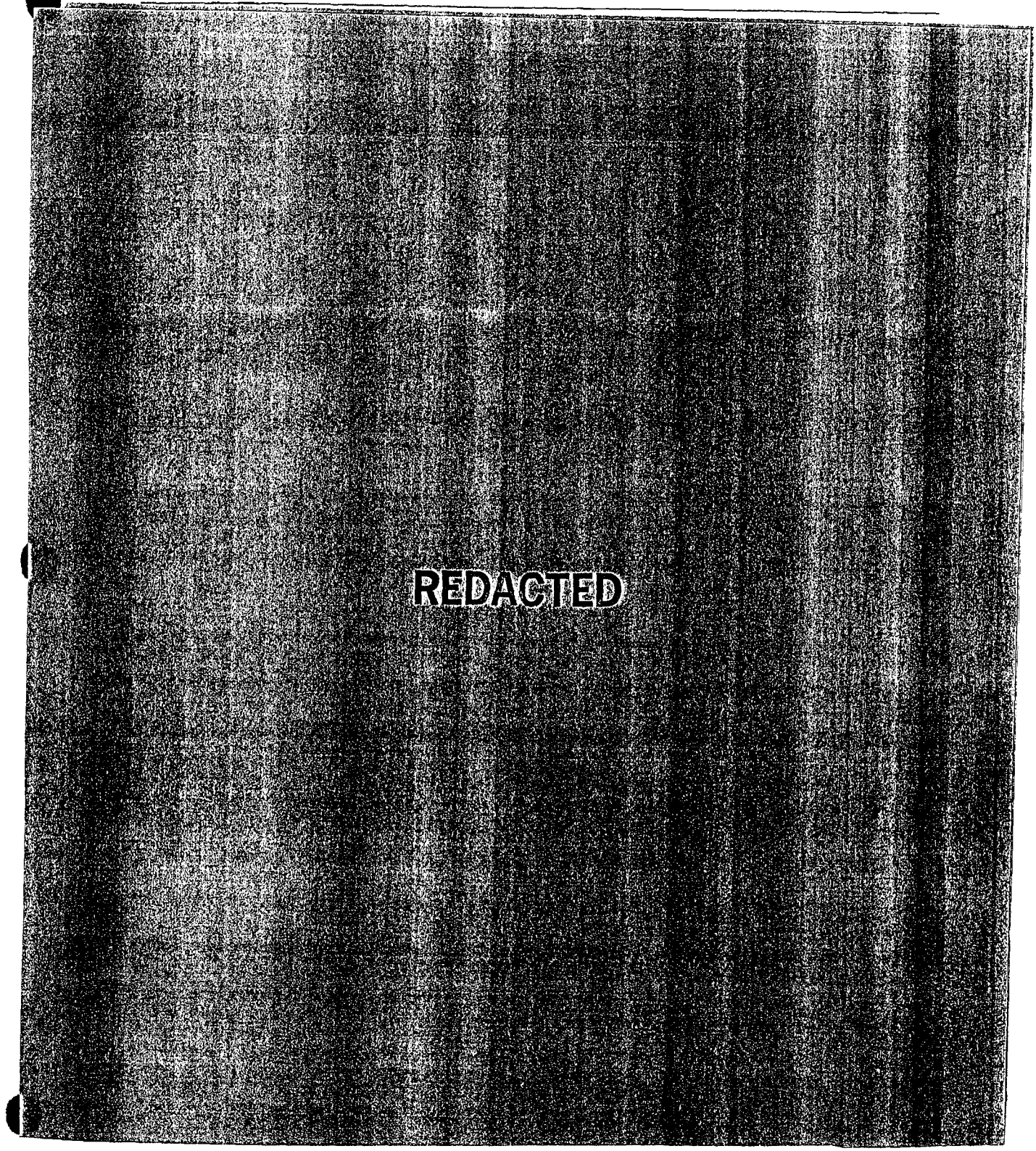
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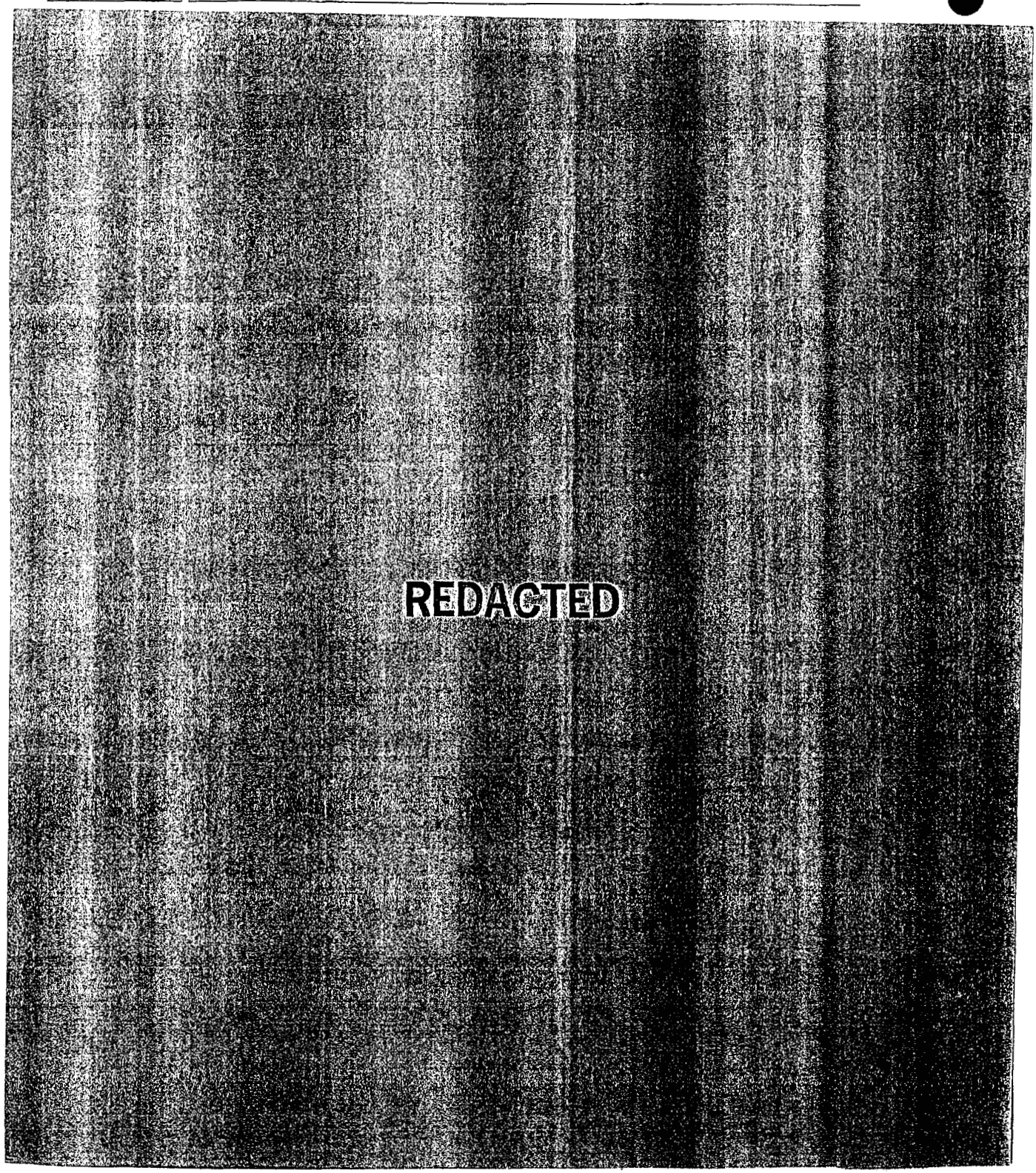
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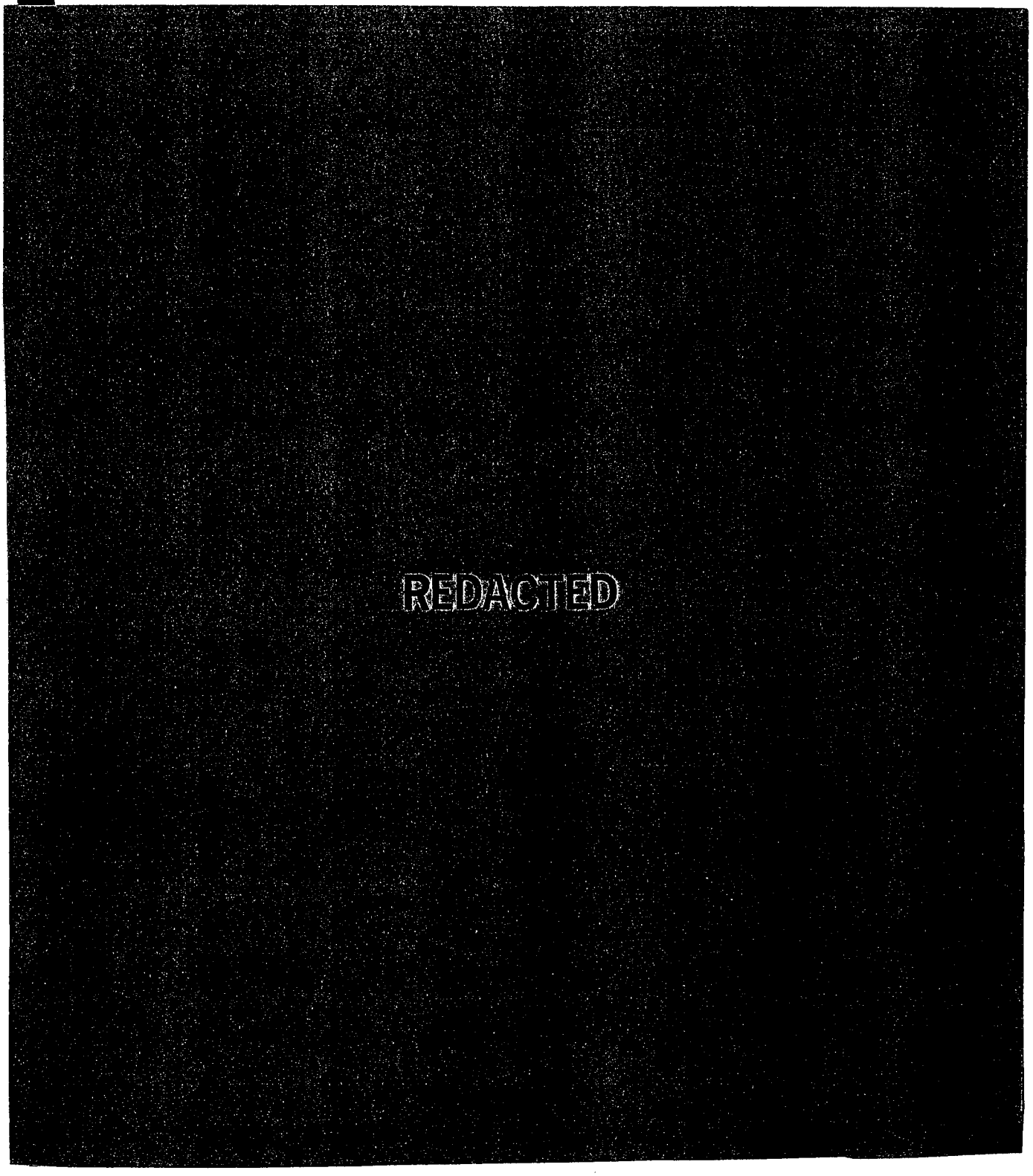
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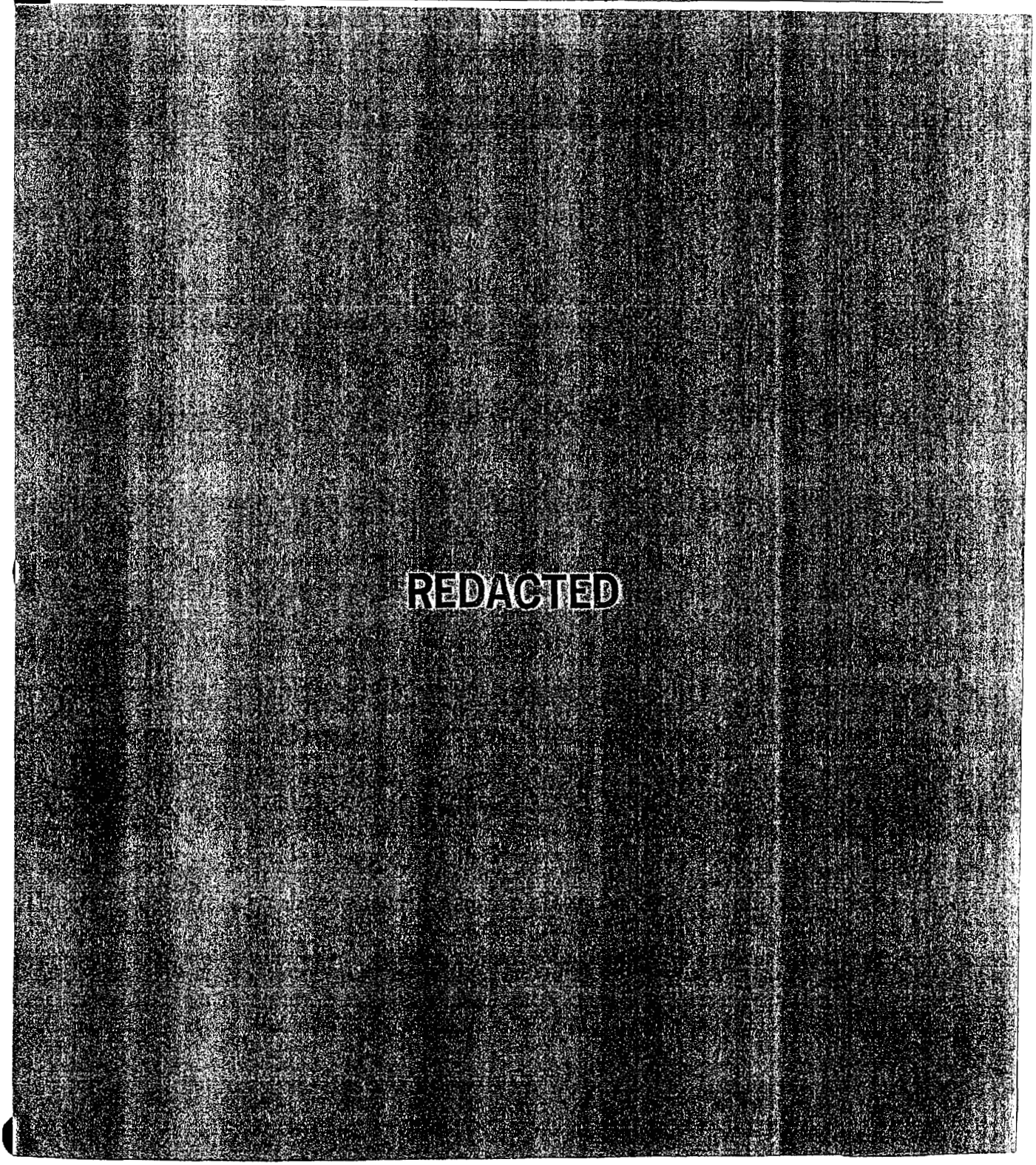
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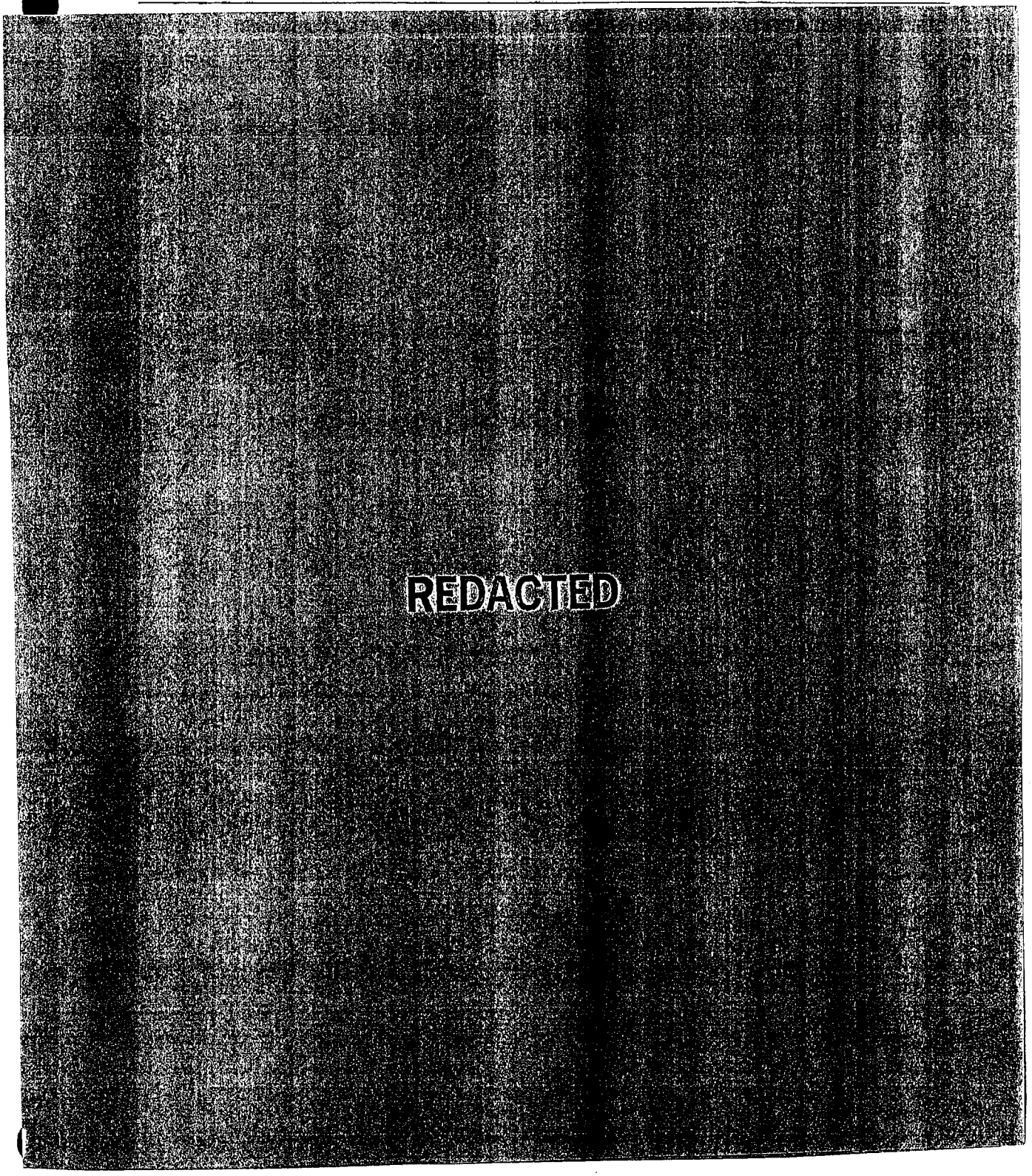
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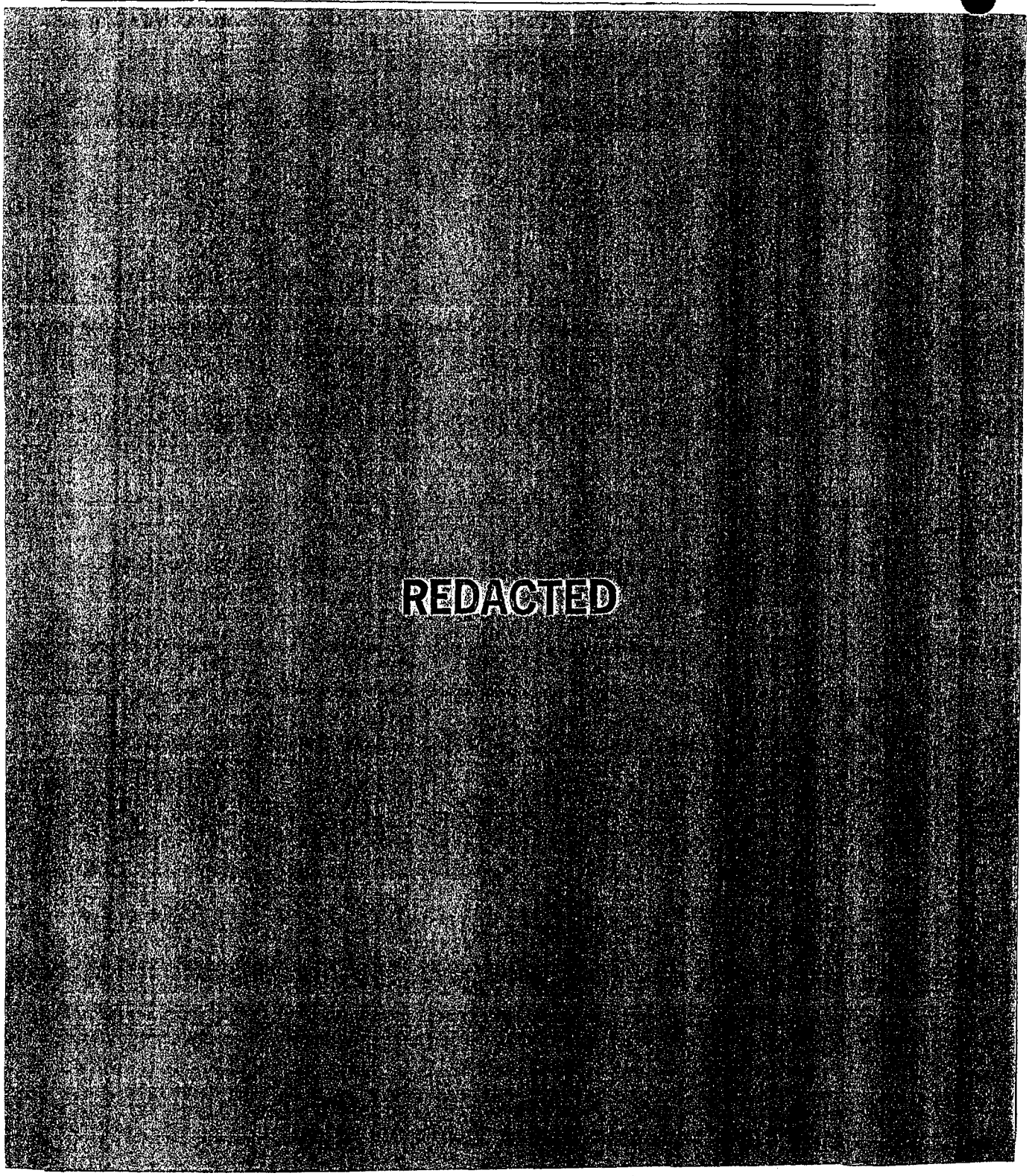
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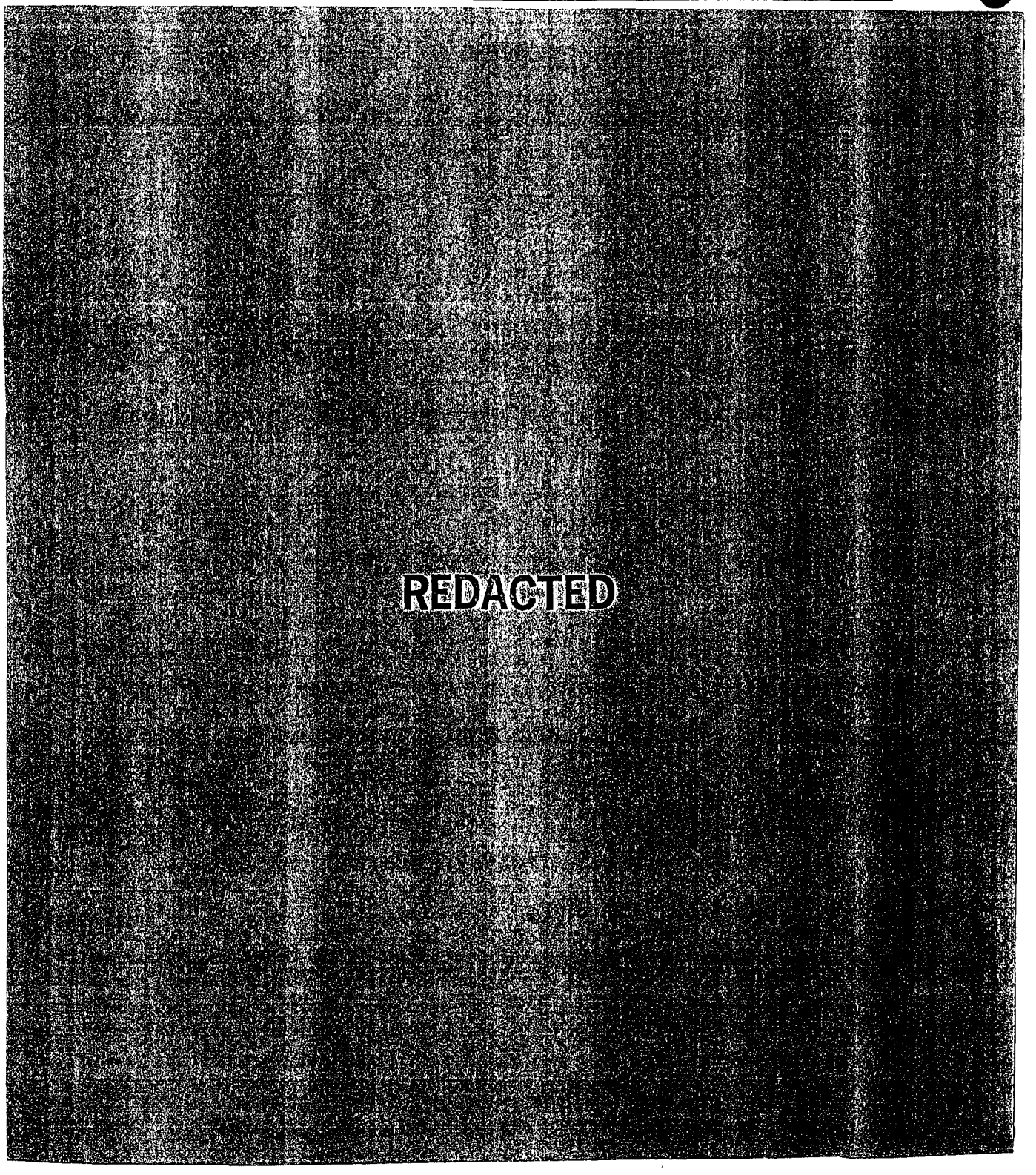
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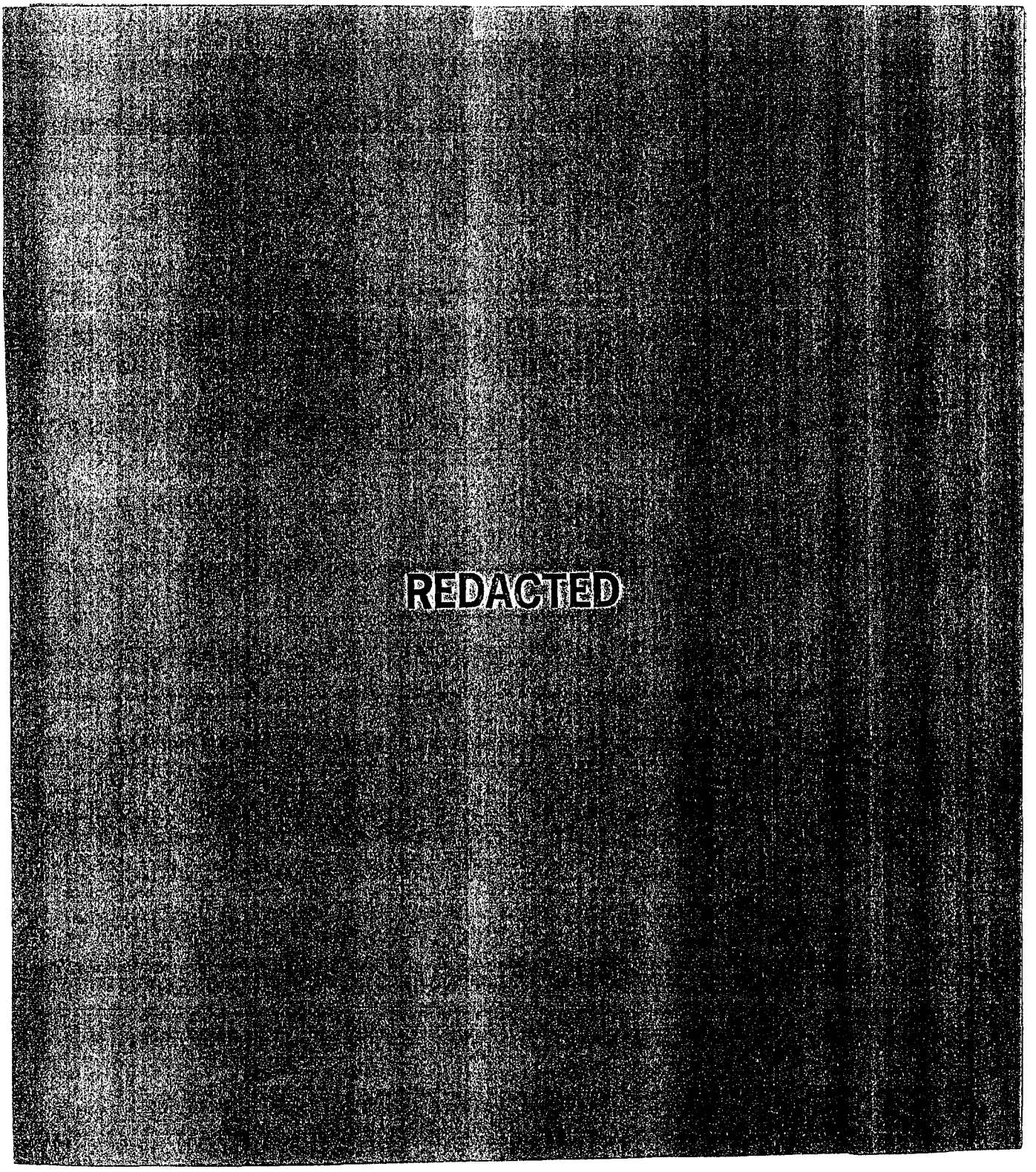
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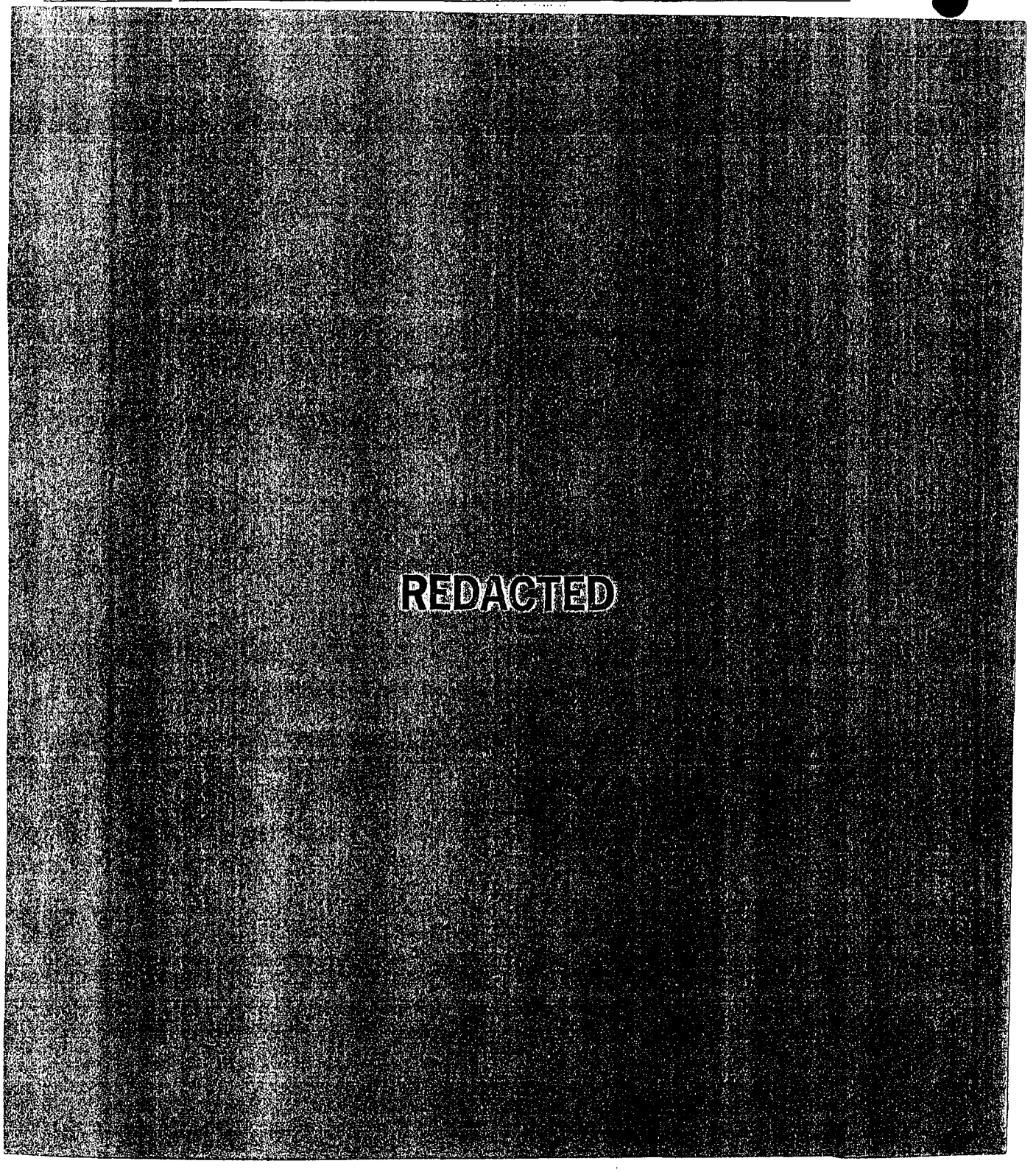
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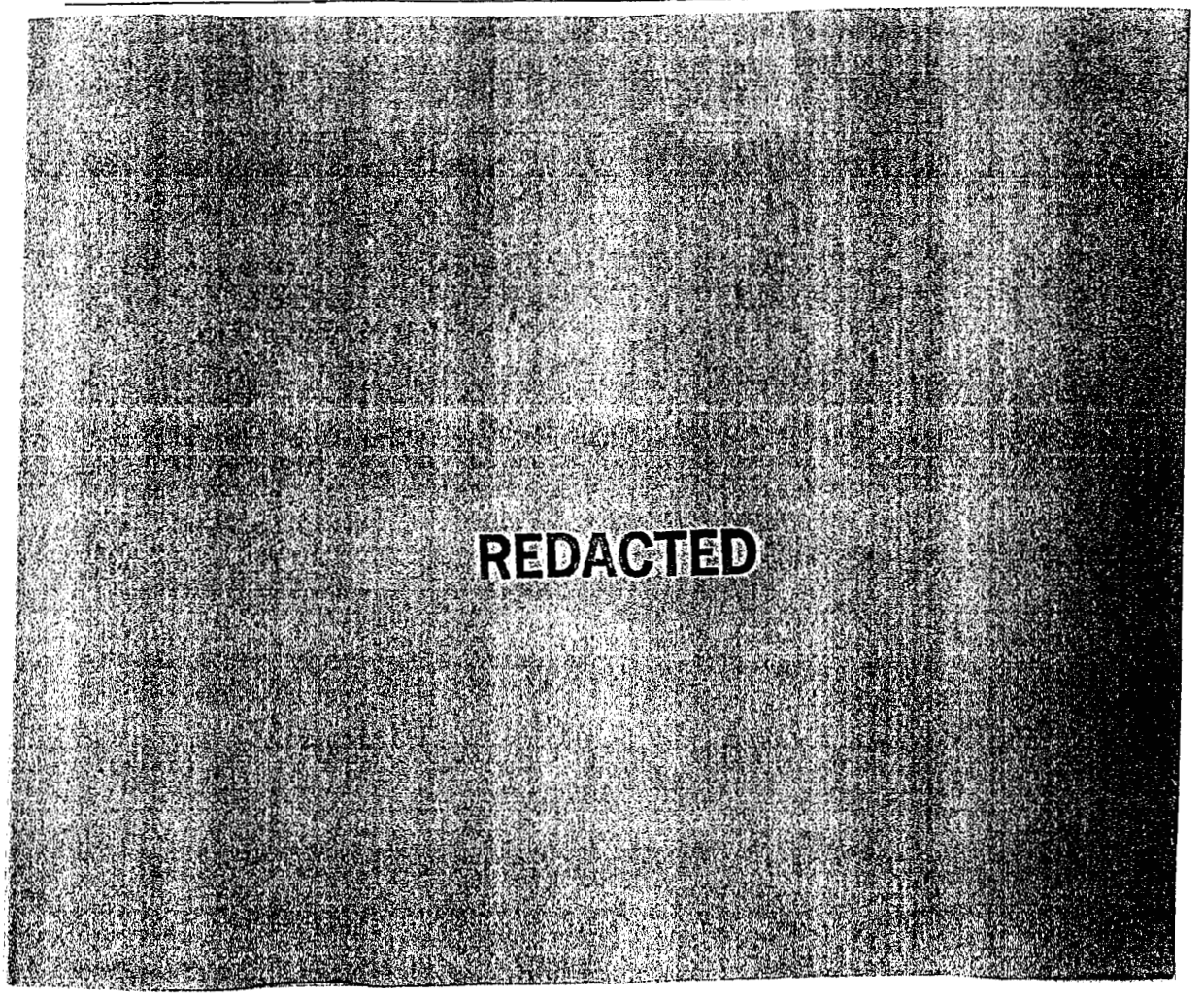
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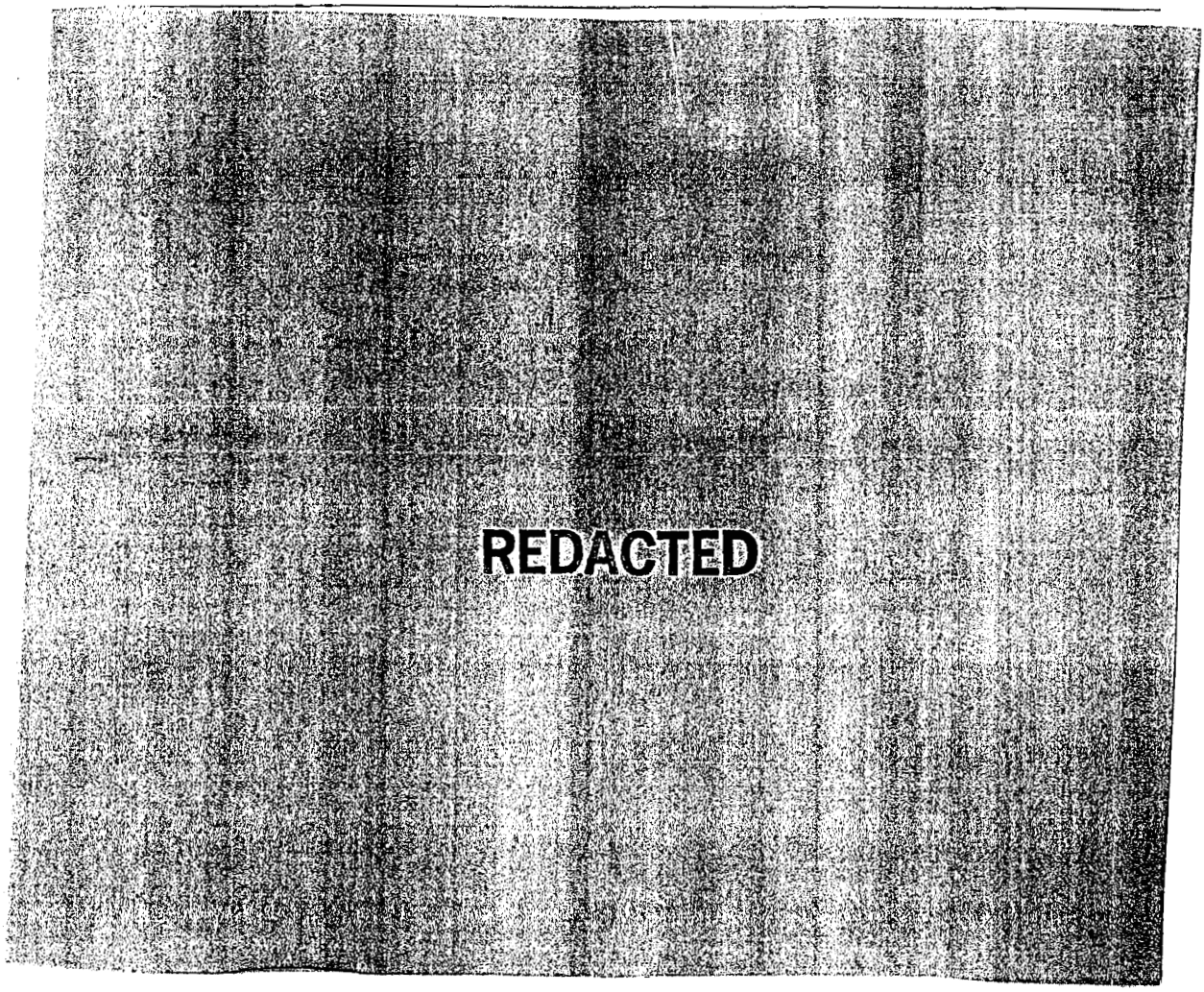
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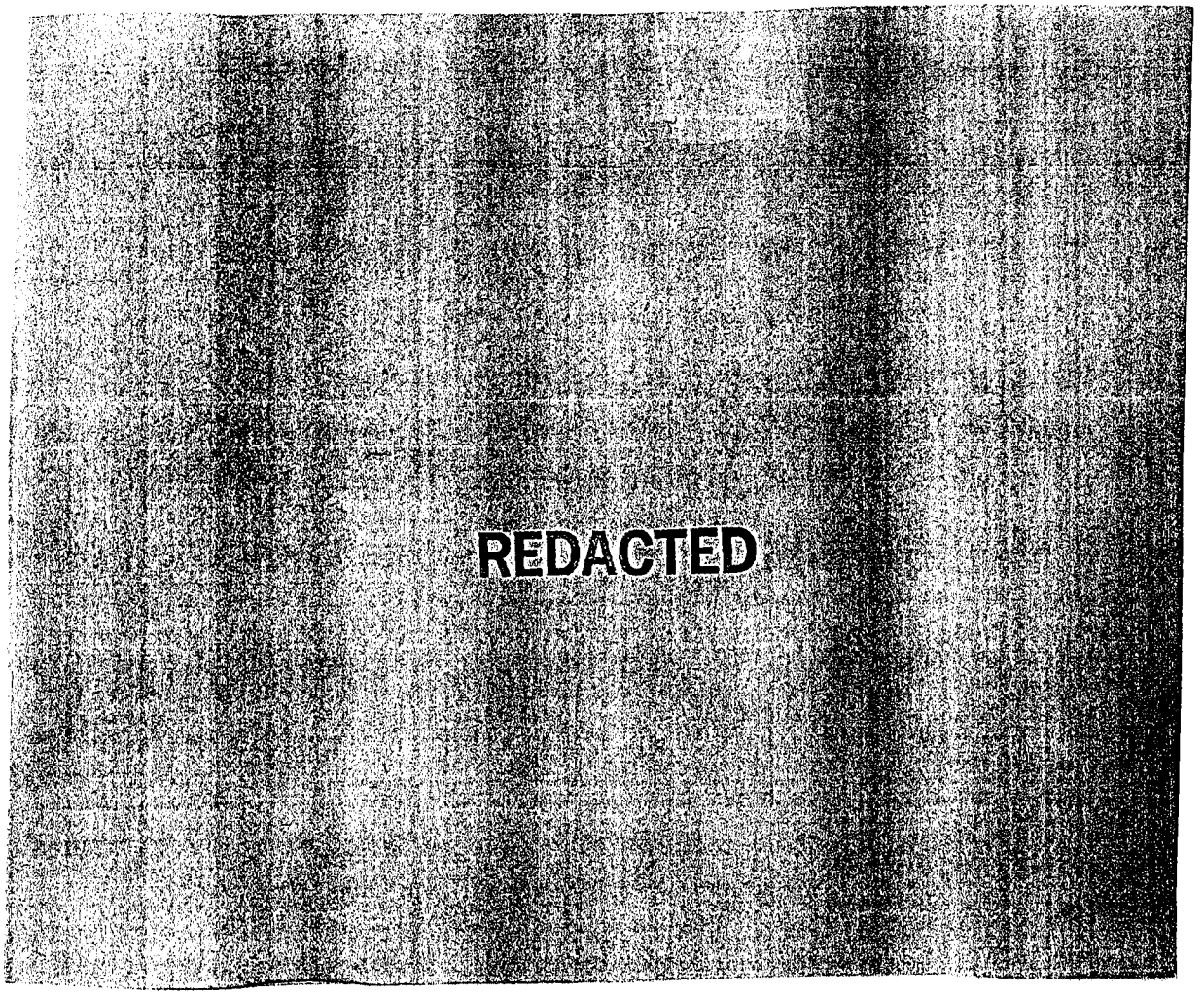
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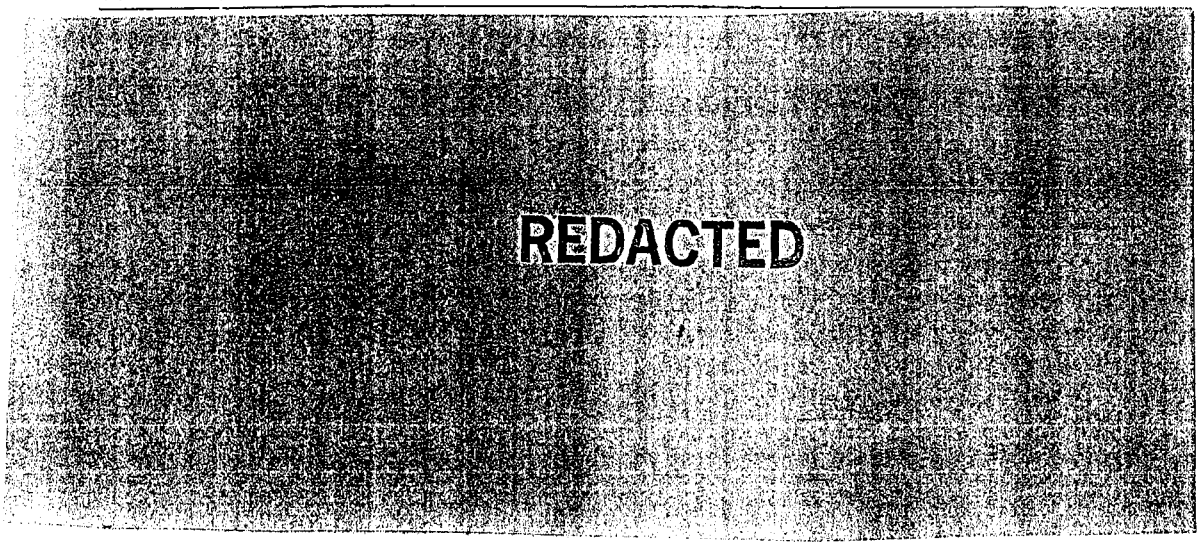
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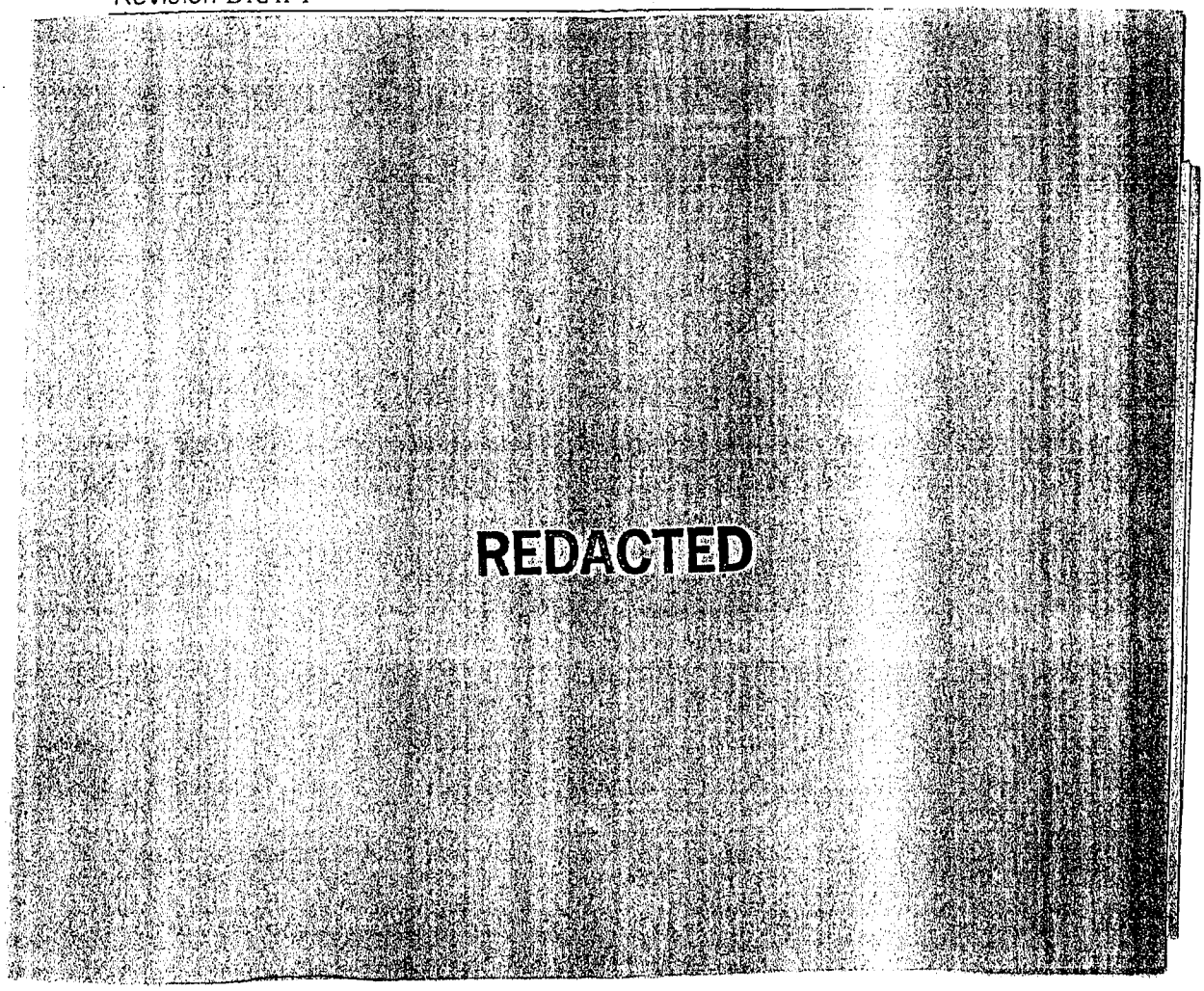
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Cope, Sandra C

From: Massey, Todd [Todd.Massey@jacobs.com]
Sent: Friday, October 05, 2007 4:46 PM
To: Hanna, Deborah A
Cc: Hazle, Steve; Plata, Ken; Hickman, Mark
Subject: 0710-LAK-P0164 - Jacobs Proposal - Progress Energy Crystal River Discharge Canal Cooling Study

Deborah,

I am happy to submit our proposal for the Crystal River Discharge Canal Cooling Study. Please contact Ken Plata at 863-669-1263 or Steve Hazle at 864-414-5590 if you have any questions.

Kindest regards,

Todd A. Massey

Inside Sales
PH - 864-676-6463
FX - 864-676-5096
Jacobs Engineering
1041 East Butler Road
Greenville, SC 29607

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JACOBS

3149 Winter Lake Road
Lakeland, Florida 33803, USA
+1.863.669.2206, Fax: + 1.863.669.2220

October 5, 2007

Ms. Deborah Hanna
Progress Energy Florida
8202 West Venable Street
Crystal River, Florida 34429

Email: Deborah.Hanna@pgnmail.com

Subject: Crystal River Discharge Canal Cooling Study
Jacobs Proposal No. 0710-LAK-P0164

Dear Deborah,

Jacobs is pleased to offer our proposal to provide conceptual and preliminary design engineering services to study methods for cooling your Crystal River Discharge Canal.

We offer a team with valuable years of experience in delivering projects with aggressive schedules. We have selected key team members with appropriate experience on similar projects to lead the cooling equipment and environmental evaluations. We have included résumés for each of the key team members for your review in the Appendix. Our organization chart is provided in the Organization and Project Team section.

You have requested that we identify other alternatives for consideration. During the study we will evaluate several alternatives to provide the required cooling. One option that you have not listed in your RFQ will be an ammonia based refrigeration system. We believe this type of refrigeration system may provide some synergy with your current plans for installing a new Urea Plant at your Crystal River facility. We are currently working with you at both Bartow and Crystal River. For this study, we will utilize team members that have worked with Progress Energy in the past and are familiar with your preferred methods and practices.

In our proposal, we have addressed concerns you listed in your RFQ, detailed our approach to the work, and provided a project schedule which we believe is obtainable. We have also completed the General Information section from your RFQ and included it with our proposal.

Jacobs currently has a Work Authorization Program in place with Progress Energy. All terms and conditions will be as agreed upon in Master Services Agreement, Contract #2767.

If there are any questions, please feel free to call me at 864-414-5590 or Ken Plata at 863-669-2163. We look forward to working with you.

Sincerely yours,

Steve Hazle
Manager, Business Development

Ken Plata
Project Manager

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PEF-NCR-00309

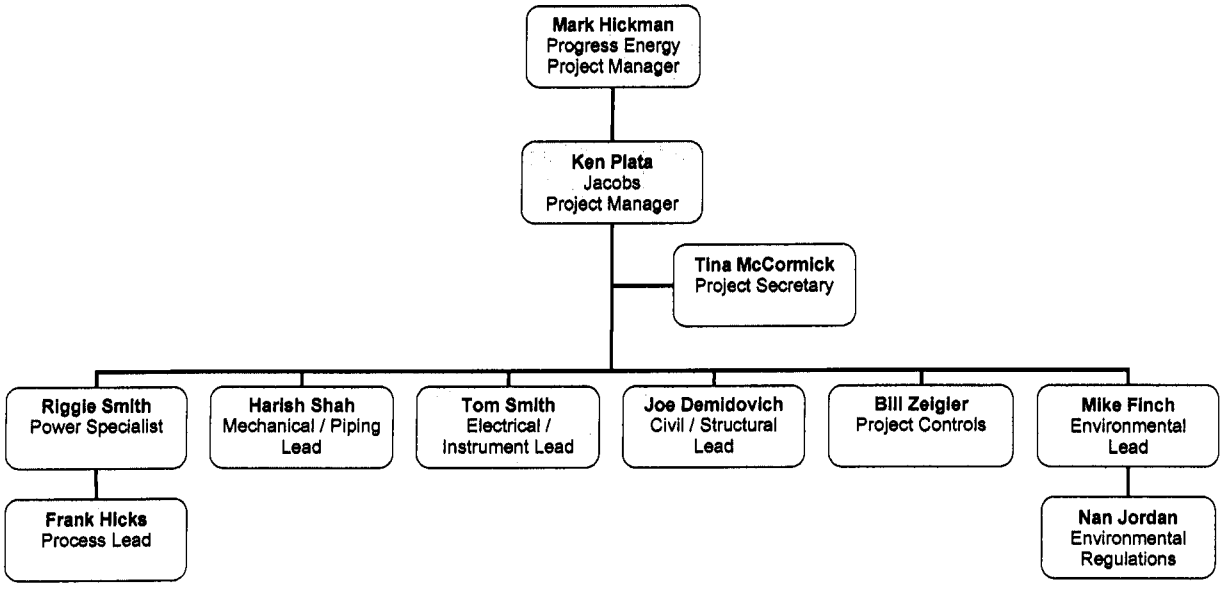
Section 1
Organization & Project Team

In order to develop a comprehensive and efficient engineering design and provide the necessary project execution support, the work will be conducted as a coordinated effort by a group of experienced managers, engineers, and designers.

1.1 Project Organization

Our project team is led by Ken Plata, who is responsible for managing the progress of the progress and reporting to your Project Manager, Mark Hickman. Ken is familiar not only with working with Progress Energy, but also with the Crystal River site. Ken is the single point of contact for Jacobs and maintains regular communication with Mark Hickman through the course of the work.

Riggie Smith is a Senior Power Engineer, has conducted studies to evaluate and recommend cooling systems alternatives at other power plants. Mike Finch provides expert services in the areas of environmental planning and design, hydrologic and hydraulic analysis, Surface Water and Flood Protection Management, plans review, code enforcement, and permitting. Riggie, Mike and the other discipline leads report to Ken on the progress of design and to communicate any issues they may incur.



1.2 Key Team Members

The **Key Personnel** nominated for the project average over 30 years of engineering experience. They were selected based on their knowledge of Progress Energy and the technical requirements to successfully complete this project. We have identified the key personnel below with a short description of their capabilities.

Ken Plata
Project Manager

Mr. Plata has over 30 years of experience in the engineering, procurement and construction fields primarily serving the fertilizer, phosphoric acid, power, chemical, pharmaceutical and pulp & paper industries. Detailed experience has encompassed areas of environmental study and compliance, project due diligence and finance, pro-forma evaluations, process calculations and design, construction and project management for a wide range of capital cost projects. Project Management has ranged from conceptual studies and estimates, to approving, managing and coordinating on-site construction projects. Mr. Plata is a Senior Project Manager in Jacobs' Lakeland, Florida Operations.

Mike Finch
Environmental Specialist

Mike has more than 25 years experience with engineering planning and design, as well as project and construction management. Mike is currently working on the permitting, drainage and wetland mitigation for the Progress Energy Clean Air Project road development, and assisted on the past review of the MTSA project. Mike provides expert services in the areas of environmental planning and design, hydrologic and hydraulic analysis, surface water and flood protection management, plans review, code enforcement, and permitting. Recent previous assignments included Surface Water Management / CRS Coordinator for Polk County; Sawgrass Expressway Design Build Drainage Engineer of Record, and Marco Island Bridge Project FDOT District One, Drainage Engineer of Record. In all projects he provided drainage design plans and permitting for both roadway widening and bridge reconstruction.

Riggie Smith
Senior Power Engineer

Riggie has a Mechanical Engineering Degree from Clemson University and 35 years of experience as a power engineer. He has led a study and estimate effort to evaluate alternatives to mitigate existing complexities for a power plant in South Carolina, and a study to convert a once-through cooling system into a closed cycle cooling system for the same client. He has significant experience in new installations and rebuilds of fossil fuel boilers for industry and utility companies. He is very well versed in emission control modifications, particularly precipitators.

Joe Demidovich
Civil / Structural Lead

Mr. Demidovich has over 34 years of experience, including 18 with Jacobs as a Senior Civil / Structural Engineer. His structural steel, reinforced concrete, and civil engineering design / supervisory experience has been utilized in the design and construction of industrial plants serving the chemical, fertilizer, food, mining, petrochemical, plastics, synthetic fuels, metal, steel, paper, power, wood products industries and gypsum wall board industries.

Frank Hicks
Process Lead

Mr. Hicks has worked in the phosphate industry for over 30 years in both plant operations and as an industry consultant. He is Jacobs Manager of Minerals, Beneficiation Projects responsible for review and approval of minerals beneficiation projects. His duties include development of internal programs to develop and apply new minerals beneficiation technology, improved plant performance, plant testing, process modifications, development of process design and computer applications for process analysis, and evaluation of process alternatives, feasibility studies, and process selection. Mr. Hicks is also responsible for the definition and mitigation of environmental impacts of mining and waste disposal.

Harish Shah
Mechanical / Piping Lead

Mr. Shah has over 34 years experience in mechanical engineering and all areas of technical job management, plant design, HVAC, plumbing, project management, facilities engineering, maintenance management, client liaison and project coordination. Experience also includes supervising

engineering and design personnel, coordinating work with other disciplines, writing specifications, engineering calculations, manhour estimates, schedules and construction cost estimates.

Tom Smith
Electrical / Instrumentation Lead

Mr. Smith has over 18 years of project management, design and construction management / start-up experience on chemical, pharmaceutical, pulp and paper, power generation and institutional projects. He has been a lead engineer on a variety of projects ranging from technical studies to full service EPC projects. His technical strengths are in power distribution, motor control, lighting, DCS/PLC interface, equipment specifications, calculations and studies. He is responsible for technical quality within the E&I department.

Bill Zeigler
Project Controls Manager

Mr. Zeigler has over 36 years of experience, including 14 years with Jacobs, serving as the Manager of Project Controls. He has held positions in planning and scheduling, cost control, estimating, procurement, field supervision, and various construction trades, providing him with a unique depth of experience to draw from in establishing and maintaining project controls systems. Mr. Zeigler's experience includes interactive planning, development of detailed schedules, application and leveling of resources, establishment of tracking systems for determining physical progress, and design and implementation of reporting systems.

Section 2
Project Approach

The following section describes the execution plan for the project.

2.1 Overview / Summary

Our technical proposal is in response to your request for the Crystal River Discharge Canal Cooling Study.

We have assembled a Project Team comprised of members with expertise in each area of performance including design knowledge with direct experience in power plant cooling towers, detailed cost estimating of industrial equipment, and experience in handling environmental wetland mitigation concerns.

We propose to manage our core team from the Lakeland, Florida office, drawing upon in-depth technical support as required from Jacobs' Tampa, Philadelphia and Greenville offices.

Our Project Team has experience in working on complex, fast track projects. We believe that the key to coordinating and implementing a project of this magnitude with tight time constraints lies with both experienced project management and open lines of communication between team members and your assigned Project Managers and staff.

We utilize several tools, including teleconferences, WebEx and JPI to facilitate the regular interaction and reviews among the various Jacobs offices. WebEx is an interactive internet tool, utilized in teleconferences, that allows team members to simultaneously review the same document, share comments and discuss issues related to the design. JPI is a secure project document sharing database that maintains project documents in a file structure that allows documents to be shared instantly between offices, regardless of location.

Upon completing the Phase 1 Study, the lead engineers begin developing the Phase 2 Conceptual Design and Estimate Package. Our technical power / process specialists oversee the conceptual design as it develops, and confirm with the discipline leads that the design follows the best industry practices and standards.

2.2 Project Initiation and Work Plan / Staffing

Upon notice to proceed, we schedule a Design Initiation Meeting (kick-off meeting) between team members from both companies. This meeting is held at the Crystal River plant site. The purpose is to discuss and confirm the following:

- Study objectives, schedule and program
- General plant plot plan layouts
- Codes and standards to be used in the engineering design
- Time required for receipt of information
- Project milestone schedule
- Project coordination procedures
- Action items that lead to additional task details
- A list of decisions relating to project approach
- Other items considered necessary by all parties including agreed actions by each party for follow-up items

The meeting concludes with an Interactive Planning Session (IPS) which forms the groundwork to develop the detailed project schedule.

2.2.1 Phase 1 – Study

The Phase 1 Study identifies and evaluates alternatives, as indicated in the Progress Energy work scope document, for reducing the discharge canal water temperature in accordance with:

- Planned thermal increase associated with CR3's EPU
- Minimizing the impact and de-rating to CR1 and CR2
- Complying with all existing and proposed environmental permits

The primary objective is to review the Scope of Work alternatives and other possible solutions, compare these alternatives and recommend the most cost effective and technically feasible solution within reason.

To facilitate this objective we plan on utilizing our power engineering consultants that have performed similar study efforts to identify issues and concerns with each alternative. Our work is broken into task assignments with the power / process group leading the initial review at the plant site. This should occur during Weeks 1 through 3.

Our disciple leads and environmental group begin their review by Week 3 and continue through Week 6. As the alternative matrix is developed we begin the economic cost estimate and schedule analysis (Weeks 7 through 8). During the final week, we prepare the Alternatives Summary Report. During this study effort we work closely with the PEF Project Manager to keep him/her informed of the development of each step. We estimate that Phase 1 requires 9 weeks to complete.

Since our Lakeland Office is only a 2 hour drive from the Crystal River complex, we envision that the majority of the work effort is competed in Lakeland. However initial data gathering and site evaluations occur during the first 2 weeks at the plant site.

We expect Phase 1 includes the following team members:

- Project Manager / Project Engineer
- Power Specialist
- Process Lead
- Mechanical / Piping Lead
- Civil / Structural Lead
- Electrical / Controls Lead
- Cost Controls and Scheduling
- Environmental Specialist
- Estimating
- Project support

2.2.2 Phase 2 – Conceptual Design and Estimate

Phase 2 Conceptual Design begins after you review and approve of the Alternatives Summary Report. The engineering completed during the Conceptual Design contains sufficient detail of the selected alternative to allow Progress Energy to solicit bids for the detail design package.

The Conceptual Design Package is in accordance with the Progress Energy work scope document, and is finalized as a Conceptual Design Report package. The work is preformed at the Jacobs Lakeland office. We estimate that Phase 2 requires 12 weeks to complete.

We expect Phase 2 includes the following team members:

- Project Manager / Project Engineer
- Power Specialist
- Process Lead
- Mechanical / Piping Lead, engineers, designers
- Civil / Structural Lead, engineers, designers
- Electrical / Controls Lead, engineers, designers
- Cost controls
- Scheduling and Planning
- Environmental Specialist and support
- Estimating
- Project support

2.3 Project Schedule and Reporting

The Scheduling System provides management with the "bridge" to achieve project objectives within the constraints of time, budgets, manpower, materials and technical specifications. It provides a schedule that defines the time in which tasks must be performed, the manpower necessary to perform the tasks and the materials and specifications required for the work to progress within the schedule.

The objectives of the Scheduling System are to:

- Assure that each performing discipline plans and schedules the work for which it is responsible
- Clearly identify time relationship, resource constraints and interfaces of the various project activities, milestones and contractual objectives
- Provide the means by which to integrate the scheduling process with the scope of work definition and budgeting processes
- Monitor and control performance with respect to scheduled vs. actual performance, impact of delays and cost alternatives
- Effectively integrate the flow of information
- Develop and control a schedule base which facilitates the assessment of work progress in terms of project milestones, work completed, percent complete of in-progress activities and viability to future project activities.

The Scheduling System provides a comprehensive time and resource analysis system based on the critical path method (CPM) technique. We utilize two leading software systems, Microsoft Project and Primavera Finest Hour. The choice of software is based on your preference and project needs.

Both systems offer a great variety of standard planning and scheduling reports. The scheduling system is fully integratable with the standard code-of-accounts, Cost System and Performance Measurement System and is able to provide Cash Flow, Quantity Flow, Manpower Requirements, Earned Value and a number of other management information tools.

The Project Master Schedule reflects the project plan showing all significant schedule dates and milestones, and establishes the overall schedule baseline. It is the control schedule for the overall project and provides a communication vehicle to our management and to you.

The Project Master Schedule establishes the framework for developing the discipline and logic network schedules. It is

intended to present a complete snapshot of the overall project schedule, without excessive detail.

The system assists the Project Team with developing a valid performance plan, monitoring performance against expected milestones and producing reports that permit the project team to redirect activities in the best interest of the project. To achieve this aggressive schedule it is critical that Jacobs and Progress Energy collaborate very closely. Therefore, we recommend beginning the project with an Interactive Planning Session (IPS) to discuss the project goals and the various interfaces among the parties. The IPS is held as part of the kick-off meeting.

2.4 Jacobs Project Information System – JPI

Phase 1 Study and Phase 2 Conceptual Design package is led by the Jacobs' Lakeland, Florida office, with assistance from our Tampa, Greenville and Philadelphia offices. Jacobs Project Information System (JPI) is used to store all project data and documents in a secure database. With JPI, you are also able to view documents for comment and approval.

All drawings and documents for this project are stored on a server in Lakeland and can be accessed with different viewing or editing privileges by different users. For example a drawing may be created and checked in Lakeland, and comments added by Greenville and Raleigh.

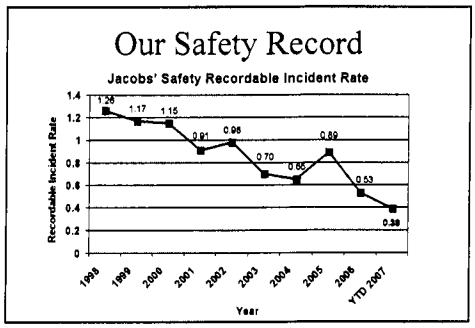
This significantly accelerates transferring electronic information; comments and questions generated on this project, as well as assists you in keeping records of plant documents in an organized electronic system.

2.5 HSE PROCESS

The objective of our HSE process is to enable our staff and other project team members to produce quality work, in a productive manner, without accident. Our definition of an accident is "an unplanned, undesirable event, which disrupts work activity". To achieve this, we promote a safety culture; emphasize accident prevention; strictly enforce HSE procedures; and continuously monitor HSE performance. Our approach involves all levels of our organization, client requirements, and contractor personnel.

We embrace a "Zero Accident" philosophy and have implemented a comprehensive HSE process. Our accident prevention standards define each level of management and employees' responsibilities. These standards ensure worker

safety and regulatory compliance. All of our employees are trained in our HSE philosophy, evaluated based on performance criteria and are held accountable for their performance.



Our program, processes and tools have facilitated consistent improvement in our OSHA Total Recordable Incident Rate. This positive trend is a direct result of our commitment to safety and the implementation of a HSE process that gets results.

The Jacobs HSE Manual is a company-proprietary document. In lieu of enclosing with this proposal the entire, large HSE Manual, we are providing the Manual's Table of Contents. The Table of Contents represents well over a thousand pages of comprehensive policies, procedures, and work instructions on a broad array of health, safety, and environment topics.

We have included a copy of our corporate *HSE Manual* Table of Contents in the Appendix for your review.

2.6 Project Support Services

Project reporting is an integral part of the project control process and is essential in keeping you informed of project status. The Project Team believes that the interaction of the Project Manager and your representatives is vital to assuring that the project is progressing as expected and that project objectives are being met.

Weekly meetings are established with key project personnel to check the current status of the project effort. Our monthly progress reports provide a summary of activities completed over the past month and activities planned for the next month; an update of the percentage of work completed by task; identification of any changes in work scope; a discussion of any project elements that are of potential concern; and a presentation of project costs to date versus budget.

2.6.1 Cost Estimating

The estimating process integrates engineering, project control and all disciplines in the development of a comprehensive capital cost estimate.

Our estimating system can generate four types of estimates:

- *Order of Magnitude Estimate* – This estimate is made prior to project definition and is used for determining economic feasibility.
- *Preliminary Estimate* – This estimate is more project specific and is often used for comparative economic analysis of alternatives.
- *Budget Estimate* – This estimate is used for cost control of engineering design projects, as well as for construction projects.
- *Definitive Cost Estimate – This is the most comprehensive estimate prepared for a project and provides the detailed targets for construction and schedule control. This grade of estimate is usually reserved for large construction projects.*

On this project we propose to develop a Budget Estimate to examine the Phase 2 alternative. The estimate requires such data as site plans, equipment arrangements, flow diagrams, and major equipment lists, and vendor budget pricing for major equipment.

2.6.2 Cost Forecasting

Cost forecasting is a management tool for early identification of cost and schedule variances. This process assures that the project receives the information required to measure performance, revise estimates, prepare cash flows, track quantities and determine project status by earned performance.

The cost forecasting analysis effort is prospective in nature rather than retrospective in that emphasis is given to providing early visibility into potential problem areas and providing an early warning system.

Due to the fast track nature of the project study, cost forecasting is a control technique for systematically reevaluating the cost, schedule and technical performance of any project every month. It is designed to update the current status of a project, incorporate all trend items and to predict future performance of cost, schedule and productivity factors for timely management decisions.

The Forecast System provides an integrated evaluation that is directly related to the estimating, budgeting, scheduling and reporting systems. Whenever operating conditions reveal a potential deviation from the project baselines, the Forecast System provides the vehicle to prepare, store and display a

plan that reflects the anticipated resources needed to complete the approved task.

The Trend Program is another control tool that is used for tracking and providing information in controlling project scope, cost and schedule. The Trend Program provides a mechanism for identifying changes in the project scope; the scope of services to be provided; the intended plant/program site quality and the current project plan.

2.6.3 Cost Control Process

Successful project execution requires effective planning and control. Our project control systems provide timely cost and schedule information necessary for successful completion of this project on time and within budget. Cost engineering begins with the development/approval of a work breakdown structure (WBS) list for the project identifying document deliverables that need to be developed and issued.

The list is input in a computerized system, which identifies the milestones for each type of drawing or specification. Budgeted work-hours for each line item are also input and, on a monthly or bimonthly basis, the lists are statused and updated. Credit for milestones is based on having fully completed the milestone.

Actual cost data for Professional Services is structured in accordance with the WBS and matches the budget in terms of breakdown and/or summary, so we are able to compare performance (earned valued) against actual cost. From that comparison, project productivity and forecasts are computed.

Performance is reported on an overall basis with a graph that compares Planned Progress to both Actual Progress and Forecasted Progress.

2.6.4 Cost Reporting

A formal cost report is issued once a month. This report contains management summaries of cost and schedule status as well as a detailed analysis of all significant changes since the previous report. The project cost report covers engineering status, and all field activities, and is integrated into the Monthly Project Status Report.

2.6.5 Quality Management Program

The Jacobs Project Team defines quality as "conformance to properly developed requirements". The overall goal of our Quality Management program is to achieve the highest possible quality of performance.

Primary reliance for quality of performance is placed upon individuals. Each Project Team member is accountable for the quality of their personal performance, and Project Manager for the collective quality of performance of those who are accountable to them. The concept of self-accountability applies to all members and emphasizes the important responsibility of every individual employee for high quality personal performance. The Project Team, under the direction of the Project Manager, assisted by the Quality Assurance Manager, applies and advances the quality process to benefit the overall project.

The essential function of the quality management program is to assist employees and managers to meet the program goals by providing a framework of policies, procedures, standards, guidance, and methods for conducting and reviewing project work. This does not eliminate or reduce the quality assurance responsibility of individuals or managers; rather it adds emphasis, reinforces, and provides assistance.

The Project Team's approach to quality management stresses careful activity planning, documentation of all activities and results, and translation of the results into a report.

As part of a Quality Management effort we prepare a contract-specific QA plan that provides a description of the contract organization, the scope of work and contracting requirements; our management approach; the assignment of specific management, technical and quality functions, duties, and responsibilities; management of subcontractors; and the management information system.

Our quality assurance program specifies procedures for calculations, database and spreadsheet design, and document preparation and review including design criteria, specifications, reports to regulatory agencies, and project technical reports. The program references standard procedures for field data collection and analytical performance in accordance with requirements. The project organization establishes the position of Quality Assurance personnel as responsible for implementation of the project QA program for the activities of the team working in conjunction with the Project Manager.

2.6.6 Scope Change Management

The Scope Change Management System is an established method for the timely assessment of the effect of scope changes on a project. This system records this effect and provides a basis for the amendment of contractual documents, when such action is necessary. This provides both our team and Progress Energy with a disciplined process for promptly and effectively incorporating changes into the job plan and control budgets. The objectives of the Change Management System are to:

- Provide a disciplined approach for the identification, evaluation, coordination, approval and execution of changes
- Maintain the integrity of the scope, budget and schedule baselines
- Incorporate changes in a timely manner into the appropriate baselines

Any changes to the scope, schedule and budget are documented by the Change Notice (CN) and the Change Order (CO) procedures. The CN/CO procedures, in conjunction with the change order logs, provide a method of controlling deviations from expected costs as defined by the scope of work and current budget. All change notices are processed through the project team, thereby alerting them of any changes in the project scope, cost, schedule or technical configuration. Upon internal review and approval, the change notices are issued to you for review. You indicate by signature authority whether the change should be implemented or not.

Section 3
Qualifying Experience

Owner's Engineering Services Include:

- Prepare bid specs for vendor turnkey projects
- Document review on third party work
- Contract conformance
- Witness testing
- Site development services
- Program management of multiple contractors
- Project cost services

Small Project Program Benefits:

- Minimized administration and procurement cost
- Shared knowledge across system
- Team continuity – alignment
- High confidence of success
- Staff augmentation / flexibility
- Cost-effective / expedient service
- Consolidated project reporting

Progress Energy Project Listing

Progress Energy
Raleigh, North Carolina
We provided balance of plant engineering services for the installation of 12 simple cycle 160-MW combustion turbines for Progress Energy at four locations in North Carolina. The work included design services for balance of plant electrical, piping, and structural. At two locations, the work also included the grading, drainage, and soil and erosion control design.

Carolina Power & Light, Co., Richmond County Plant
Richmond County, North Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 8 G.E. Frame 7FA units, 4 initially in simple cycle operation and 4 in combined cycle operation. Simple cycle units are designed to be converted to combined cycle operation in future. Responsible for review of all aspects of design, by the equipment suppliers and the turnkey contractor. Also responsible for all balance of plant design, including site grading, drainage, and paving, interconnection of utilities within facility as well as coordination of interconnection with local utilities, and design and coordination of installation of combination control building/warehouse/shop. Involvement also includes selection of source of water, selection of engineering firm for design and construction management, and review of water system design.

Rowan County Phase II & III

"Jacobs has done an outstanding job. There were no glitches in understanding the scope of work."

"Overall, the project went very well. Jacobs adapted quickly to a project that had many constraints. Jacobs' staff took the initiative to retrieve the information that they needed without bothering Progress Energy. This reflects the quality and experience of the staff. Jacobs did an excellent job. Progress Energy looks forward to the next one."

Jack Sparks & Warren Hilliard
Progress Energy

Carolina Power & Light, Co., Rowan County Plant
Rowan County, North Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 3 G.E. Frame 7FA units, initially in simple cycle operation and provision for future addition of 2 units in combined cycle operation. Simple cycle units are designed to be converted to combined cycle operation in future. Responsible for review of all aspects of design, by the equipment suppliers and the turnkey contractor. Also responsible for all balance of plant design, including site grading, drainage, and paving, interconnection of utilities within facility as well as coordination of interconnection with local utilities, and design and coordination of installation of combination control building / warehouse / shop. Involvement also includes selection of source of water, selection of engineering firm for design and construction management, and review of water system design.

Carolina Power & Light, Co., Wayne County Plant
Goldsboro, North Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 4 G.E. Frame 7FA units, initially in simple cycle designed to be converted to combined cycle operation in future. Responsible for review of all aspects of design, by the equipment suppliers and by the turnkey contractor. Also responsible for all balance of plant design, including site paving, interconnection of utilities within facility as well as coordination of interconnection with local utilities, and design and coordination of installation of combination control building / warehouse / shop. Project also included specification and design of a new filter plant to supply water to both the new CT operation as well as existing coal fired operation located adjacent to new CT plant.

Carolina Power & Light, Co., Asheville Plant
Asheville, North Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 2 G.E. Frame 7FA units, initially in simple cycle designed to be converted to combined cycle operation in future. Responsible for review of all aspects of design, by the equipment suppliers and by the turnkey contractor. Also responsible for balance of plant design, including site paving, interconnection of utilities within facility as well as coordination of interconnection with local utilities. Also included study and design of new access road into plant for receiving large quantity of fuel oil trucks in winter.

Carolina Power & Light Co., Darlington County Plant
Hartsville, South Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 2 – Seimens-Westinghouse Frame 501D units in simple cycle operation. Responsible for review of all aspects of design by the equipment suppliers and by the turnkey contractor.

Carolina Power & Light Company
Darlington County, South Carolina
Complete design responsibility for 630 MW of combustion turbine-generators. This project included eleven (11) turbine-generator units designed for simple-cycle operation, fuel storage, 230 kV switchyard, remote controls and all associated auxiliary facilities. The plant was also designed and laid out for the future installation of waste heat boilers and steam turbine generators. The facility was completed and on-line only 15 months after initial Jacobs/Client conference and came in under estimated cost.

Carolina Power and Light Company
Raleigh, North Carolina
Complete engineering design services for the installation of two waste heat boilers at the Cape Fear Plant. These boilers produced 177,000 pph steam each utilizing the waste heat from IC turbines exhaust system. This resulted in a combined cycle operation efficiency of 41% for the facility utilizing the two existing GE combustion turbines. Engineering included designing required interfaces and modifications to facilitate the conversion to combined cycle operation.

Carolina Power & Light
Roxboro, North Carolina
Unit 1 - 360 MW; Unit 3 - 720 MW; Unit 4 - 720 MW
Units 3 and 4 are dual boiler units

The Roxboro plant is located near Research Triangle Park in Raleigh. We have performed a number of study and design assignments on these units. The station has three Riley stoker units with double reheat and superheaters. Among the assignments were:

1. Retrofitted Unit 3 with an electrostatic precipitator.
2. Performed study and design on Unit 4 and added a gas recirculation system to improve unit rating. System included fans, ductwork, and controls.
3. Performed studies and design to correct cooling water exchanger system overloads and turbine backpressure on Units 1, 2, and 3.

4. Performed studies and preliminary design to retrofit flyash handling for the four units at Roxboro. Currently working on design.
5. Performed study and made recommendations for control and test of water chemistry system and additional Unit 3 cooling.
6. Upgrade the 8-cell cooling tower and the 6-cell cooling tower.

SCE&G Experience

In addition to our experience with Progress Energy we have also provided engineering and construction support to SCE&G. The following is a listing of projects that we have completed for SCE&G.

Wateree Station (Eastover)

- **Engineering Study and cost estimates for conversion to Closed Cycle Cooling System.**
- **BOP Engineering for House Service Cooling Towers relocation, Fabric Filters, and SCRs.**
- Controls Engineering Services for PLC and DCS (WDPF and Ovation) upgrades on various systems.
- Engineering Services for painting the main stacks.
- Engineering Study of boiler structure wind bracing repairs.
- Engineering Services for small projects.

SCE&G EPCM Cooper River Bridge Tunnel

- 115kV Submarine Cable – 7000' tunnel for new 10,275' transmission line
- EPCM contract
- EPCM contracting selected as offering the best balance between risk, schedule, and price

McMeekin Station (Lake Murray)

- Engineering for replacement of the 60" Circulating Water Supply and Return Headers. This project is similar to the CCCS in respect to the large circulating water headers.
- Engineering for foundation for Bottom Ash & Pyrites Silos.
- Engineering for various small projects.
- Engineering Support for paving & drainage on the East Side of the plant.
- Engineering Study of the turbine gland seal steam regulator piping.
- Engineering for revision to Service Water piping and pumps.
- Engineering for relocation of Hydrogen Storage.
- Engineering Analysis of three Fuel Oil Unloading locations.

Williams Station (Goose Creek)
- Engineering to convert the boilers from oil to coal fired.
- Front End assistance to scope BOP engineering for SCRs.
- Engineering for PLC Upgrades on Ash Handling and Coal Handling.
- Engineering for Filter / Separator support on top of Ash Silo.

SRS (Savannah River) "D" Powerhouse
- Study to define upgrades required to improve reliability and controls at new load conditions.

Other Relevant Experience

Alstom Power (formerly ABB)
Currin County, California
We were contracted by Alstom Power to provide design engineering services for a 1,048 MW combined cycle power plant near Bakerfield, CA. The plant consists of four natural gas fired, single shaft GT 24 combustion turbine-generators, heat recovery steam generators, steam turbines, and associated plant equipment.

We provided mechanical, civil, structural, piping, electrical, and control systems engineering for balance of plant systems including main cooling water, fuel gas, water supply, waste water collection, compressed air, and ammonia storage and handling. We prepared equipment specifications for the cooling towers, miscellaneous pumps, fire protection systems, fuel gas conditioning equipment, and air compressors; as well as construction specifications. We prepared all civil design for the project, as well as foundation and steel design for the HRSGs and Turbine Generator Building.

Confidential IPP Project
Northwest U.S.
- Jacobs is the EPCM contractor
- GE 7-FA 1x1 Combined Cycle – 290 MW
- Maximum duct firing, dual fuel, inlet cooling
- Sliding pressure HRSG design for load flexibility

Delmarva Power & Light Company
Wilmington, Delaware
Preparation of a study for 20 year life extension of three coal-fired units at the Indian River Plant. The study included site improvements, rotary car dumper, conveyors, crusher house, transfer towers, bunkers, coal mills, coal piping, and coal feeders for all three units. Plant is a four-unit station with one unit burning low sulfur coal and a unique coal handling

arrangement. Study and estimate was completed and a phased improvement plan prioritizing the work over a 3 year span was included.

Desoto County Power, LLC
Desoto County, Florida
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 2 – G.E. Frame 7FA units in simple cycle operation. Responsible for review of all aspects of design by the equipment suppliers and the turnkey contractor.

Effingham County Power, LLC
Effingham County, Georgia
Subsidiary of Progress Energy, Inc. – member of Owner's engineering team for selection of source of water for cooling tower makeup for 2 G.E. Frame 7FA units in combined cycle operation. Involvement includes selection of source of water, selection of engineering firm for design and construction management, and review of water system design. Project includes the provision for the utilization of municipal reuse water for makeup.

ER&L
Duplin Cogeneration
Turnkey bid and initial design, state-of-the-art pulverized coal fired boiler. One of first PC boilers permited as BACT with DNC (Dry NOx control) with an outlet of 0.03 lb/MMBtu. Facilities serves an ethanol plant. Power facilities included pulverized fired boiler (420,000 lb/hr, 1,550 psig, 1005 degree F steam), 26-MW non-condensing turbine, 100% auxiliary boiler back-up, water treatment, and balance of plant auxiliaries.

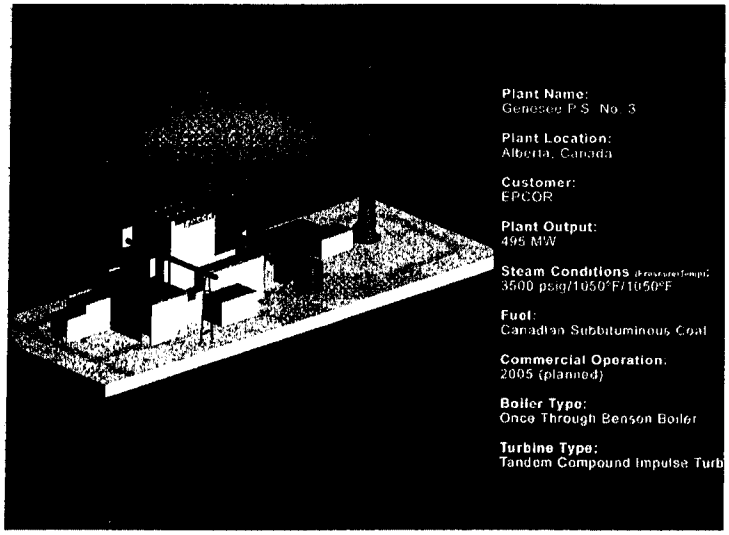
General Electric
Gebze, Turkey
Provided balance of plant engineering for a Frame 9E (123-MW) power project with provisions for a future HRSG and steam turbine addition. The installation was for Colakoglu Metals.

General Electric
United Arab Emirates
Provided balance of plant engineering for 5-MS 6001 B gas turbines installed at four facilities (Al Nakheel, Dhaid, UAQ, and New Qidfa).

Hillman Ltd.
Hillman, Michigan
Jacobs contracted as the turnkey design / construct contractor for this 17 MW wood-fired, small power production facility. Engineering services included licensing assistance, performance testing and certification. The power sales agreement is with Consumers Power Company. The client was Stockmar Energy, a subsidiary of the Philadelphia Leasing Corporation. The project completion and commercial operation date was February 1988.

Hitachi – (EPCOR)
Edmonton, Alberta, CanadaJacobs is the BOP engineer and constructor for a 500MW super critical coal-fired power plant under Hitachi as EPC contractor. Plant includes a wet FGD system.

Hitachi's 495MW Genesee 3 PlantAlberta, Canada



Hopewell Cogeneration
Hopewell, Virginia
Provided study, development, design review, and construction startup assistance for a 356 MW gas turbine combined cycle cogeneration facility which included three (3) 89 MW gas turbines, three (3) HRSG's, one (1) 98 MW steam turbine, cooling tower, water treatment plant, and associated auxiliaries. The project was awarded to ABB, and we managed the turnkey contract. This facility is fully dispatchable with the electric power being sold to Virginia Electric Power Company. The steam is sold to Aqualon Company.

L'Energia, Limited Partnership
Lowell, Massachusetts
Provided design, procurement and construction for an 81.6 MW combined cycle cogeneration power facility. The plant is designed with a Siemens V64.3 gas turbine, heat recovery steam generator, and a two-stages condensing steam turbine generators. The facility utilizes state-of-the-art dry combustor technology and interconnects to the New England Electric Company system. The steam is sold to Borden Inc.'s Prince Pasta Plant. Jacobs services included design, procurement, construction, and construction oversight, as well as training, performance testing and startup.

LaPaloma Power, LLC
Kern County, California
Furnished Engineering services for the LaPaloma Power Project. The plant consists of four 1 on 1 combined cycle units using Alstom GT 24 single shaft gas turbines with a net electrical output of 1,048 MW. The units are fueled by natural gas. Jacobs scope includes civil, structural, architectural, mechanical, electrical, and control engineering services. Major systems designed include main cooling water (cooling tower), fuel gas preparation, compressed air, waste treatment, plant water distribution, site work, and all foundations. The project is scheduled for start-up 1st quarter 2002.

Unique challenges to this project included the rigorous plan approval process in California, seismic design issues, and fast track nature of the project considering the current energy situation in California.

Lakewood Cogeneration
Lakewood, New Jersey
Design and engineering for a 236 MW combined cycle cogeneration facility including two 80 MW dual fuel combustion turbine generators with dual pressure heat recovery steam generators, an 88 MW extraction, condensing turbine generator, auxiliary boiler, cooling tower, water treatment plant and associated auxiliaries.

Monroe Power, LLC
Monroe, Georgia
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 2 – Seimens-Westinghouse Frame 501D units in simple cycle operation. Responsible for review of all aspects of design by the equipment suppliers and by the turnkey contractor.

Northwest Energy (Williams Lake) Limited Partnership
Williams Lake, British Columbia
Completed a 60 MW wood-fired generating station for NW Energy. The $92 million EPC turnkey project greatly exceeded performance standards in all areas including heat rate and power output. The particulate and NOx emissions were well below limits. Jacobs also provided operations and maintenance manuals, operator training, startup and performance testing.

The facility improves air quality by disposing of sawmill wood waste in a more environmentally controlled method than the beehive burners at five local lumber yards. The wood waste is prepared to a size required by the fuel handling system to generate 60 MW of electric power to be sold to B.C. Hydro under a 25-plus year agreement. The boiler produces 561,750 pph of steam at 1550 psig and 950°F. The plant has a design plant life of 35 years.

Based on the success and excellence of the Williams Lake project, NW Energy Corp. received the 1992-1993 *Project of the Year Award* from the Project Management Institute, West Coast British Columbia Chapter. The project was also recognized as Consulting Engineers of South Carolina's 1994 Best of Show and received First place for Energy Production / Conservation.

Northern States Power Company
Minneapolis, Minnesota
Design and procurement for the conversion of four 12.5 MW utility units from stoker coal firing to refuse derived fuel firing. The conversion of two units at NSP's Red Wing Station includes a RDF receiving and storage station, RDF reclaim and conveyor to the powerhouse, new boiler feeders, boiler modifications, and new ash handling equipment. Red Wing will be an RDF dedicated system. The two units at Wilmarth Station will receive similar modifications and additions, but will retain coal firing capability as well as RDF capability.

Savannah Electric Power Company
Port Wentworth, Georgia
Unit 1 - 50 MW; Unit 2 - 50 MW; Unit 3 - 100 MW
Oil Fired

Conversion from oil to coal firing. The conversion to coal required boiler inspections, economizers, superheaters, and burner replacement. The conversion required the retrofit of new precipitators, new flyash handling systems, new I.D. fans, a new stack, and new breeching and ash disposal.

Stratton Energy Associates,
Stratton, Maine
Executed a turnkey design-construct contract for this 40 MW wood-fired, independent, power producing facility. The facility consists of a spreader stoker, traveling grate, water wall boiler burning wood chips and residue to generate 400,000 lbs/hr of steam at 1485 PSIG at 955°F to power a 45 MW (gross) turbine generator.

Viking Energy
Lincoln, Michigan
As the turnkey contractor to Viking Energy, we provided complete preliminary and final design, licensing assistance, cost estimating, procurement and construction services for this 16 MW wood-fired small power production facility adjacent to Hill Forest Products sawmill.

Virginia Electric and Power Company
Richmond, Virginia
Responsible for developing scope for the conversion of three oil-fired units to coal firing. Project included structural, electrical, instrumentation, piping, etc. for ash handling, ID fans, and air emissions control equipment.

Responsible for all design and engineering data required for retrofit of electrostatic precipitators and auxiliary equipment on four existing units at three locations. These units were converted from oil to coal firing. The project included foundations, erection of structural steel, ductwork, ash handling equipment, piping, stairs, ID fans, etc. Also included were insulation and painting of equipment.

Possum Point Unit 3	-	175 MW
Yorktown Unit 2	-	180 MW
Chesterfield Unit 3	-	105 MW
Portsmouth Unit 3	-	170 MW
Portsmouth Unit 4	-	245 MW
Chesterfield Unit 4	-	175 MW
Possum Point Unit 4	-	240 MW

Virginia Electric and Power Company
Portsmouth, Virginia
Unit 3 - 170 MW; Unit 4 - 240 MW
Oil- and Coal-Fired

Conversion from oil to coal firing. The conversion to coal required boiler inspections and burner replacement. A new fly ash handling system and rework of the bottom ash system were included. Retrofit of electrostatic precipitators for each

unit was accomplished, and I.D. fans were reworked on Unit 3 and Unit 4.

Virginia Electric and Power Company
Portsmouth, Virginia
Design / construct turnkey contract for the life extension and uprate of two 100 MW units at Portsmouth, Virginia. These units were uprated to 120 MW each and reconverted to coal firing. Extensive rebuild of the coalbunkers, piping, pulverizing equipment, fans, and ash handling system was required. Instrumentation, condensers, turbine generators, and air pollution control equipment were replaced. The steam generators were retubed and modifications to steam and condensate piping were included.

Westwood Energy Properties
Joliett, Pennsylvania
We provided engineering, procurement, financial arrangements, and construction services; managed construction, and purchased all equipment and bulk materials. The project generates a nominal 30 MW of electric energy for sale to a public utility by burning coarse anthracite mining refuse (culm) in a circulating fluidized combustion boiler.

Section 4
Commercials

Jacobs is pleased to have the opportunity to propose our services to Progress Energy regarding the Crystal River Discharge Canal Cooling Study. We believe our offering has addressed the issues stated in your RFQ. We look forward to meeting with you to discuss our offering and optimize our ability to work with you in pursuit of your goals.

HOURS ESTIMATE

Phase 1 REDACTED

We estimate Phase 1 requires [redacted] hours to complete, based on the scope of work described in your RFQ and the proposed scope of services provided in this proposal.

Phase 2 REDACTED

We estimate Phase 2 requires [redacted] hours to complete, based on the scope of work described in your RFQ and the proposed scope of services provided in this proposal.

COMMERCIALS

REDACTED

We propose to provide our services on a [redacted] under the terms and conditions of the Master Engineering Agreement between Progress Energy and Jacobs Engineering dated May 1, 2000. We will not exceed the value of the Purchase Order without prior approval from Progress Energy.

REDACTED

[redacted]

REDACTED

We look forward to working with you on this project. Please let me know if I can answer any questions or if you need any additional information. I may be reached at 864-676-6179.

CLASSIFICATIONS AND BILL RATES

For home or branch office personnel working in their home office, the following will apply:

Jacobs Engineering Office-Based Personnel –Bare Hourly Salary Rate Ranges

CLASSIFICATION	BARE HOURLY SALARY RANGE
Manager of Projects/ Process Specialists	REDACTED
Project Managers/ Department Managers	
Technical Managers	
Technical / Environmental Specialist	
Construction Managers	
Senior Project / Process / Mechanical / Civil / Structural / Electrical / Control Systems Engineers	
Process / Mechanical Engineers	
Senior Mechanical / Piping Designers	
Mechanical / Piping Designers	
Civil / Structural / Electrical / Control Systems Designers	
Senior Estimators / Purchasers	
Purchasers and Expediters	
Scheduler, Cost Engineer, Quality, Safety, Information Systems	
Document Control	
Secretarial and Clerical	
Lab Technicians / Chemist	
Accounting	

These rates are effective as of the date of this proposal and are valid until December 31, 2007.

Rates listed are bare hourly rates. Bill rates are subject to a multiplier of [redacted] per labor hour for "Other Direct Costs", as provided in the Master Engineering Agreement between Progress Energy and Jacobs Engineering dated May 1, 2000.

REDACTED

ESTIMATED COST

Phase 1

We estimate the total cost for this work on a time and expense basis is [redacted] which includes an allowance of [redacted] for travel. Reimbursable travel related expenses are billed at actual cost.

REDACTED

CONFIDENTIAL PEF-NCR-00341

Phase 2

REDACTED

We estimate the total cost for this work on a time and expense basis is [redacted], which includes an allowance of [redacted] for travel. Reimbursable travel related expenses are billed at actual cost.

BILLING PROCEDURES AND DOCUMENTATION

Invoices are submitted for professional services and travel expenses on a monthly basis and are payable within 30 days by wire transfer.

Jacobs Engineering Group, Inc.
Bank of America
Dallas, Texas
ABA: 111000012
International Swift Code: NBDLIQ21
Account #: 3750362891

This proposal is subject to acceptance within 30 days.

CONFIDENTIAL

Appendix

- Résumés
- Safety / HSE
- QA / QC
- General Information

Résumés

Name:	**KENNETH J. PLATA**
Title:	**Senior Project Manager**
Education:	B.S., 1976, Mechanical Engineering University of Tennessee Masters in Business Administration, University of Houston 1981 (1 year credit)
Special Training:	Total Quality Management Facilitator 1992 - 1995 Jacobs Project Management School – 2000 Jacobs Management Leadership Training - 2000
Registration:	E.I.T. - 1976 - Tennessee
Affiliations:	American Society of Mechanical Engineers Technical Association of the Pulp and Paper Institute

Mr. Plata has over 30 years of experience in the engineering, procurement and construction fields primarily serving the fertilizer, phosphoric acid, power, chemical, pharmaceutical and pulp & paper industries. Detailed experience has encompassed areas of environmental study and compliance, project due diligence and finance, pro-forma evaluations, process calculations and design, construction and project management for a wide range of capital cost projects. Project Management has ranged from conceptual studies and estimates, to approving, managing and coordinating on-site construction projects. Mr. Plata is a Senior Project Manager in Jacobs' Lakeland, Florida Operations.

Representative assignments include:

- Senior Project Manager/Project Engineer in providing detail design for a phosphoric acid plant revamp, in which the process was modified from dihydrate to hemihydrate. Client was confidential. The project was extremely fast track with the project schedule shortened from 15 months to 11 months for engineering, procurement, construction, start-up and commissioning. Duties included capital cost estimates, equipment selection, process revisions, layout modifications, budget control, resource loading, scheduling and overall project controls.

- Senior Project Manager in providing Basic Engineering Services for the $50MM expansion of the San Juan de la Costa mining and beneficiation operations for Grupo Fertinal S.A. de C.V. in San Juan de la Costa, Mexico. Specific duties included the development of the basic engineering package, and overall profit and loss responsibility for project costs. Assisted in process identification, equipment selection, site development, interaction with Mexican design firms and schedule coordination. Engineering package was at a level of detail to allow for a fixed cost estimate to be developed.

- Senior Project Manager for basic engineering and detail design services for the MAP/DAP production rate increase for the Lazaros Cardenas chemical plant for Grupo Fertinal S.A. de C.V. Project would boost production by adding a new pipe reactor in series with the preneutrailzer. Existing elevators and equipment were reviewed for capacity increase. Duties included capital cost estimates, equipment selection, process reviews, budget and project controls.

- Senior Project Manager for organizing and providing personnel for the pre-commissioning, start-up and commissioning of a new ammonium sulfate plant for the Lazaros Cardenas chemical plant for Grupo Fertinal S.A. de C.V. Project duties included monitoring activities for check-out and start-up, and advising client of problem areas where engineering solutions could be provided.

- Senior Project Manager for the conceptual feasibility study, AFE estimate and detail design for a new SPA/sulfur transload facility for PCS Phosphate, located in Lake City, Florida. The facility included railcar storage, molten sulfur unloading. Storage and loading to trucks.

- Senior Project Manager for two tissue machine rebuilds for confidential client. Project was schedule driven to meet specific product quality improvements and increased output. Major task was successfully managing both machine rebuild designs simultaneously on an extremely fast track schedule (8 months). Project objective was met with machine commissioning weeks ahead of planned start-up curve for both production and quality. Specific duties included capital cost estimates, equipment selection, process revisions, layout modifications, design reviews, budget control, resource loading, scheduling and project controls.

- Senior Project Manager for the road modifications and stormwater retention pond design for Progress Energy Crystal River facility. Project is part of the Marine Time Security Act (MTSA) requirements in conjunction with the terrorist security initiative. Project included road modifications, handling and storage of storm water runoff and addressing security concerns.

- Senior Project Manager for the initial process study and conceptual design layout and capital cost estimates for Bausch & Lomb in the Non-Sterile Pharmacy/Compounding areas, and Sterile Fill Compounding areas. Project effort addressed containment of Category 3 compounds, assessing operator exposure, product cross contamination and architectural access/egress requirements.

- Senior Project Manager in the development of a Comprehensive Environmental Study for Tampa Electric's Big Bend Station in Apollo Beach. The study included a detailed evaluation of plant process operations with emphasis on the generation and handling of coal combustion products, storm water management, and impacts to groundwater at or near combustion products management units.

- Senior Project Manager for a major modification to the industrial waste water system at the TECO Gannon power plant. This project is a portion of the major project valued at $800 MM.

- Senior Project Manager in the detail feasibility and conceptual design study for the installation of a new solid oral dosage pharmaceutical facility to be built in Miramar, Florida for Groupe Ethypharm. Work effort included process design, architectural design, validation and FDA review.

- Senior Project Manager for the specifying and design of a new neurotechnology system for low NOx burners as part of the environmental compliance requirement for coal fired boilers.

- Senior Project Manager for the design and procurement on an entrainment separator and new thermal mechanical compressor at the Polk Power Station. This project is part of the brine system improvement program.

- Senior Project Manager for the installation of a new slag handling system at the coal gasification plant as part of the Polk Power Improvement program. The construction effort completed one month ahead of schedule and on budget.

As a Senior Project Manager for Ford, Bacon and Davis, Inc., Mr. Plata's project activities included:

- $60 million wet flue gas desulfurization system for Southern Indiana Gas and Electric Company.
- Owner independent engineer, providing technical, market, construction and feasibility analysis for two (2) de-inking and recycle fiber projects.
- Site project engineer for the rebuilding of a reactor building, process equipment installation, start-up and commissioning for Merck Sharp & Dohme in Barceloneta, Puerto Rico.
- Various engineering studies for General Electric, Georgia-Pacific and International Paper.

As an Area Project Engineer, Mr. Plata's project activities included:

- $20 million project for a new chlorine dioxide plant and sodium chlorate modification.
- $12 million retro-fit of an existing chlorine dioxide facility from a sulfuric acid/chlorate process to an SVP-Methanol process.
- Provide design and engineering development for a new $40 million lime kiln and recausticizing system.
- $80 million capital cost improvement to an existing paper mill consisting of a lime kiln expansion, new recausticizing equipment, effluent treatment expansion, chlorine dioxide facility and tank farm.
- $15 million capital cost improvement to an existing paper machine with the addition of a new dryer section; reel relocation; new hydraulics system and the design/installation of a new roll handling system.

As a Mechanical Process Engineer, Mr. Plata was responsible for providing process engineering design, cost review, manpower requirements and on-site coordination for a wide variety of capital projects for Georgia-Pacific and Union Camp. Specific projects included paper machine rebuilds (wet end to dry end), recovery boilers, phenolic resin spray dryer, HVAC design for control rooms, MCC's and warehouses. Also provided engineering assistance on various surety type losses.

As a Piping Engineer Mr. Plata was responsible for providing engineering evaluations, detail design and specification for chemical and phosphate industries.

Operations Engineer for Gulf Oil in Port Arthur, Texas. Duties included operating and maintaining one of four power plants at the site.

Employment History:

Jacobs Engineering Group Inc. Senior Project Manager	1997 to date
Resolution Management Consultants, Inc. Senior Consultant	1996 – 1997
Ford, Bacon and Davis, Inc. Senior Project Manager	1992 – 1996
Parsons & Whittemore Construction, Inc. Area Project Engineer	1990 – 1992
BE & K Engineering/Construction, Inc. Project Engineer	1988 – 1990
Sandwell Engineering, Inc. Mechanical Process Engineer	1982 -1988
Raytheon Engineers Y Constructors, Inc. Piping Engineer	1981 – 1982
Brown & Root Engineering/Construction Mechanical Engineer	1978 – 1981
Gulf Oil, Inc. Operations Engineer	1976 – 1978

Name: **MICHAEL D. FINCH, PE**

Title: **Senior Drainage Engineer**

Education: BS, Civil Engineering, University of Missouri-Rolla, 1985

Registrations: Professional Engineer, Florida (40118), 1988

Affiliations: Member, American Society of Civil Engineers (ASCE), Since 1982
Officer, Ridge Branch/Florida Section 1997-2001

Member, Florida Engineering Society (FES), Since 1990
FICE Water Resources SWFWMD Liaison Committee Member

Member, National Society of Professional Engineers (NSPE), Since 1990

Member, Florida Floodplain Managers Association (FFMA), Since 2003, Chairman 2004

Citizen's Advisory Committee, Polk Transportation Planning Organization
Member 2001-2007, Chairman 2005

Mike has more than 25 years experience with engineering planning and design, as well as project and construction management. As the Surface Water Management/CRS Coordinator for Polk County, he gained a familiarity with the specifics of your day-to-day business that will be an asset to you on this contract. He can provide expert services in the areas of environmental planning and design, hydrologic and hydraulic analysis, Surface Water and Flood Protection Management, plans review, code enforcement, and permitting.

Representative assignments include:

- Sawgrass Expressway Design Build from Atlantic Blvd. to Coral Ridge Drive, Florida's Turnpike Enterprise, Broward County, FL, Drainage Engineer of Record. Provided drainage design plans and permitting for roadway widening.
- Marco Island Bridge, FDOT District One, Collier County, FL, Drainage Engineer of Record. Provided drainage design plans and permitting for roadway and bridge reconstruction.(January 2006 to Present)
- I-75/SR 80 Interchange, Lee County, FDOT District One, Senior Drainage Engineer. Provided drainage design plans and permitting for roadway reconstruction. Also prepared Pond Siting Report. (January 2006 to Present)
- US 27, FDOT Districts One, Moorehaven, FL, Expert Witness. Provided expert witness services for inverse condemnation case on US 27.
- SR 5, FDOT District Five, Brevard County, FL Expert Witness. Provided expert witness services for right-of-way takings on SR 5.
- Polk Parkway, Section 3A and 3B, FDOT Turnpike District, Polk County, FL, Project Manager/Senior Drainage Engineer. Provided remedial drainage design, permitting, and coordination at Ramp F and Terrace Way.
- Sebring Parkway (Phase II) PD&E, FDOT District One, Highlands County, FL, Senior Drainage Engineer. Prepared Location Hydraulics Report, Conceptual Drainage Plan, and Pond Siting Report.
- US 27 (SR 25), SR 544 to Blue Heron Bay Boulevard, Polk County, FDOT District One,

Senior Drainage Engineer. Provided drainage design plans and permitting for rural/urban roadway reconstruction from 4 lanes to 6 lanes. Also prepared Pond Siting Report.

- I-595 PD&E Study, FDOT District Four, Broward County, FL, Senior Drainage Engineer. A planning study to develop and evaluate improvement alternatives for the I-595 expressway from I-75 to I-95. Responsible for conceptual drainage and environmental permitting. (2004)
- Southwest Florida Water Management District, Bartow Regulation Department, Surface Water Permitting Supervisor. Administrative and technical work supervising professionals and various technical support staff in activities relating to SWFWMD. Responsible for application receipt, administrative disposition, technical evaluation by staff, field inspection, legal review, and presentations.
- Southwest Florida Water Management District, Bartow Regulation Department, Surface Water Permitting Evaluator. Responsible for the technical evaluation of surface water permit applications for compliance with District rule criteria before permit issuance.
- Hillsborough County Stormwater, Hillsborough County, FL, Senior Water Resources Engineer. Provided engineering design, permitting, construction management and final certification services.
- Roy Haynes, Veronica Lake and Pine Lake Drainage Outfall Improvements, Hillsborough County Stormwater, FL, Senior Water Resources Engineer. Responsible for client coordination, stormwater modeling, plan/permitting preparation, and construction administration. The Project is located in the Curiosity Creek Watershed, Northwest Basin, Hillsborough County encompassing an area of approximately 530 acres. The Hillsborough County Public Works Department, Stormwater Management Section directed RS&H to evaluate and improve the existing drainage within the vicinity of Lakes Sophia and Pine, and Round and Pine Ponds, these areas flood during certain storm events, primarily due to being located within landlocked or localized closed basins. The sub-basins did not have a positive outfall; therefore the lakes/ponds within them accumulated stormwater runoff and historically were slow to recover, resulting in less than healthy systems. To help minimize flooding within these neighborhoods, interconnected gravity storm sewer systems and outfall control structures for Lake Sophia, Round Pond, Pine Pond and Pine Lake were designed. Additional flood storage was obtained by excavating around three of the interconnected water bodies. In conjunction with the proposed flood control excavation and storm sewer systems, three lakes had extensive restoration components implemented via the enlargement and/or addition of littoral shelves.
- Cypress Creek Water Control Structure, Operations Schedule Permitting, Tampa Bay Water, Pasco County, FL, Senior Water Resources Engineer. Permitted the implementation of an operations schedule for the water control structure in the Cypress Creek Wellfield. The purpose of the operations schedule was to retain water above the structure during times of high flow to increase aquifer recharge and increase rehydration of the Cypress Creek floodplain without causing stress or hydrological impacts to wetland and upland ecosystems upstream and downstream of the structure.
- Cypress Creek Wellfield (CCWF) Surface Water Management Project, Tampa Bay Water, Pasco County, FL, Senior Water Resources Engineer. Responsible for feasibility study preparation, design/permitting and construction management services for a multi-objective wetland restoration and surface water management project, for a 138 square mile watershed. The primary objective was to modify surface water drainage patterns resulting in improved wetland hydrology at sites in the eastern portion of the CCWF. An additional objective was to reduce nuisance flooding in adjacent residential subdivisions.

- I-595 PD&E Study, FDOT District Four, Broward County, FL, Senior Drainage Engineer. A planning study to develop and evaluate improvement alternatives for the I-595 expressway from I-75 to I-95. Responsible for conceptual drainage and environmental permitting.
- Ulmerton Road (SR 688), FDOT District Seven, Pinellas County, FL, Senior Drainage Engineer. Responsible for the design drainage system for the complete reconstruction of 2.3 miles of existing four-lane roadway to an urban six-lane divided facility from Oakhurst Road to 119th Street.
- Homestead Extension to Florida's Turnpike (HEFT), Miami-Dade County, Florida-Senior Drainage Engineer. Widening of HEFT to six lanes from SR 836 (Dolphin Expressway) Interchange to the Okeechobee Mainline Barrier Toll Plaza, a distance of approximately six miles. Improvements consist of modifications to the interchanges with the Dolphin Expressway, NW 41st Street, and NW 12th Street, and the addition of a collector-distributor roadway system and auxiliary lanes.
- Tampa International Airport Runway and Taxiway Modifications for Runway 36L, Tampa, FL, Senior Drainage Engineer. Design for an enlarged high-speed taxiway exit and reconstruction and enlargement of the existing run-up pad for runway 36L. Responsible for all drainage design/construction feasibility and permitting for the runway improvements as well as all drainage permitting for the Tampa International Airport Airside "C" apron.
- Lake Gibson Outfall Improvements, Howard Johnson, Lakeland, FL, Manager/Senior Drainage Engineer. Responsible for the preparation of design plans and environmental permitting of the stormwater conveyance system through the Howard Johnson property from Lake Gibson to the I-4 R/W. The existing outfall pipe had failed and was removed from service, requiring improvements to the outfall ditch.
- Pinellas County Utilities, Pinellas County FL, Senior Water Resources Engineer. Provided Utility Engineering Design, specifications preparation and permitting services for the construction/replacement of a triplex pump station.
- Marion County Parks Department and FDER Office of Greenway and Trails, Marion County, FL, Senior Water Resources Engineer. Provided utility engineering design and permitting services for the construction of several drinking water wells and sanitary septic tank systems.
- Southwest Florida Water Management District (SWFWMD), Bartow Regulation Department, Surface Water Permitting Evaluator. Responsible for the technical evaluation of surface water permit applications to ensure compliance with District rule criteria before permit issuance. Also, acted as the interim Field Services Supervisor.
- I-4 Way in Motion Station (WIMS), FDOT District Seven, Hillsborough County, FL, Senior Water Resources Engineer. Preliminary Design of two wells for the potable water systems and two sanitary sewer drain fields to service the new I-4 eastbound and westbound WIMS. Applicable permitting through the Hillsborough County Environmental Protection Commission and Hillsborough County Public Health Department was also performed.
- Administrator of Stormwater Management and Environmental Permitting, Head of the Drainage Design and Permitting Units. Directed and monitored staff and consulting engineers in the review, design and permitting of drainage systems for streets, roads and highways. The design and permits were coordinated with all applicable federal and state agencies, regulatory agencies, local governments, and private development. Provided interpretation, direction, and technical guidance in the application of Policies and Procedures, Design Guidelines, Standard Indexes, and other documents to consultant,

government, and FDOT personnel. Performed administrative tasks for the Unit. Prepared and maintained unit production schedules. Prepared and negotiated manhour estimates and scope of services. Screened potential consulting engineering firms for work associated with Department projects. Assisted in the development of the District's Work Program.

- Districtwide Drainage, FDOT District One, Senior Drainage Engineer. Provided field review, engineering analysis and design services for various design projects and drainage complaint investigations. (2002)
- General Water Use Permit Renewal Application (WUP #202023.007), Phoenix Industries, Winter Haven, Florida. Senior Water Resources Engineer. Phoenix Industries is an Industrial Complex, Public Warehouse Operation – Freezers, Coolers, and Dry Storage. Responsible for the Preparation of the SWFWMD application and documentation for six (6) wells with 125,000 gpd (6 year) and 137,5000 gpd (10 year) annual average quantity. (1999)
- Environmental Administrator, FDOT District One. Coordinated and negotiated with permitting agencies to obtain approvals. Other responsibilities similar to the Project Duties: Served as the Head of the Environmental Unit, directing the analysis of impacts relating to projects and serving as an environmental advisor to the District, also serving as the interface between FDOT, FHWA and environmental agencies. Responsible for supervising staff members in the accumulation, evaluation and review of information pertaining to highly complex environmental problems, which include noise, air quality, wetlands, threatened and endangered species, floodplains, water quality, historic/archaeological, socioeconomic statements, environmental assessments, categorical determinations, reevaluations, early notifications, 4(f) statements and environmental permits. (January 1993 to January 1994)
- Project Development Engineer, FDOT District One. Served as the Engineer of Project Development with the responsibility to supervise the Engineering Project Managers in the simultaneous management of projects, (Project Development and Environmental, PD&E Studies). Responsible for making independent judgments in providing the technical review and oversight of the engineering aspects associated with all PD&E studies to insure compliance with all applicable state and federal technical standards. Negotiated the scope of work and manhours on consultant related projects. (January 1994 to October 1994)
- Polk County Engineering Services Division, Surface Water Management/CRS Coordinator. Administrative and technical work supervising and coordinating the activities and assigned personnel in the administration and implementation of the provisions of the Flood Protection and Surface Water Management Code and Plan, Surface Water Protection Code, and FEMA/NFIP Community Rating System Program. (October 1990 to January 1993)
- Southwest Florida Water Management District, Bartow Regulation Department, Surface Water Permitting Supervisor. Administrative and technical work supervising professionals and various technical support staff in activities relating to SWFWMD. Responsible for application receipt, administrative disposition, technical evaluation by staff, field inspection, legal review, and presentations. (August 1988 to October 1989)
- Southwest Florida Water Management District (SWFWMD), Bartow Regulation Department, Surface Water Permitting Evaluator. Responsible for the technical evaluation of surface water permit applications to ensure compliance with District rule criteria before permit issuance. Also, acted as the interim Field Services Supervisor. (August 1987 to August 1988

PEF-NCR-00352

Name: **RIGGIE C. SMITH**

Title: **Process Engineer**

Education: B.S., 1972, Mechanical Engineering, Clemson University, South Carolina

Mr. Smith has 35 years of process design engineering experience on power and pulp and paper projects. He has experience as an area project engineer, power department project engineer, total project engineer, and project manager.

Representative assignments include:

- Process Power Project Engineer, Duke Energy, Marshall Power Station. Lead on Study and Estimate of alternative boiler scenarios to replace the existing decommissioned package Auxilary Startup Boiler. Study considered replacing the existing boiler with either multiple trailer mounted rental boilers, a single larger package rental boiler or a permanent new package boiler.

- Process Power Project Engineer, Georgia-Pacific, Port Hudson, Louisiana. Design of a 60MW DAEC Turbine Generator with all associated auxiliary equipment. Auxiliaries included a Gland Steam Leakoff System, Lube/Control Oil System, Surface Condenser, Steam Jet/Inter-after Condenser System, Hotwell Pumps. Responsible for the interconnection of the existing mill steam system to the new Turbine Generator.

- Process Power Project Engineer, Georgia-Pacific, Monticello, Mississippi. Lead on Study and Estimate for a new Pet Coke Fired Circulating Fluidized Bed Boiler and Turbine Generator with all associated auxiliary equipment.

- Process Power Project Engineer, South Carolina Electric and Gas. Lead on Study and Estimate for a Closed Cycle Cooling System Project that converts the Unit 1 and Unit 2 Turbine Condenser Cooling Water System from once through to closed cycle. Two new field erected counter flow Cooling Towers and their associated auxiliary equipment are required to make this change.

- Power Project Engineer, South Carolina Electric and Gas. Design of plant engineering and assistance on Construction Packages for major plant outagees.

- Power Project Engineer, South Carolina Electric and Gas. Design of the Fly Ash System required for a major environmental project that included the installation of new fabric filter baghouses and SCR's for two super critical, pulverized coal fired boilers.

- Expert Witness – Power, Eimer Stahl. Assisted the law firm of Eimer Stahl through the arbitration trial as an expert witness for a confidential client in litigation with an independent onsite power producer.

- Power Project Engineer, Confidential Client. Planning for and implementation of an energy crisis project. The project consisted of installing a temporary steam system and a permenant electrical system for the mill's existing users.

- Power Project Engineer, Georgia-Pacific. Precipitator Rebuild Project. Addition of a new field and conversion to a dry bottom design on an existing precipitator that services a recovery boiler converted to a low odor design.

- Power Project Engineer, Mitsubishi. Utilities study for the addition of a new process line.

- Total Project Engineer, International Paper. Design project for the addition of a new chlorine dioxide plant with pulp mill modifications and associated energy modifications.

- Power Project Engineer, Confidential Client. Power house study for the addition of 600 psig package boilers and associated auxiliaries to support pulping modifications.

- Process Department Project Engineer, Sappi . Gas Burner Retrofit project for a CE, VU40 Coal Boiler to reduce NOx. Included damper and actuator replacement.

- Process Department Project Engineer, UNC Industrial Power, Odessa, Texas. Detail design of a 2.6 MW Gas Turbine Generator skid and enclosure including all on-skid and off-skid auxiliaries.

- Process Department Project Engineer, International Paper, Eastover, South Carolina. Study on pulp mill modifications and a chlorine dioxide plant expansion.

- Process Department Project Engineer, Confidential Client. Design and engineering on a 34 tons per day, R8 chlorine dioxide plant including balance-of-plant auxiliary equipment.

- Project Engineer, Department of Energy, Morgantown, West Virginia. Design and engineering on coal gasification project.

- Project Engineer, Confidential Client. Design and engineering on a 2,500,000 pound black liquor solids per day recovery boiler and its auxiliaries. The superheater outlet is rated at 1325 PSIG, 900°F.

- Project Engineer, NW Energy (Williams Lake Generating Station), Williams Lake, British Columbia. Design and engineering on a 60 MW condensing turbine generator with three uncontrolled extractions. Turbine generator has inlet steam conditions of 1550 PSIG, 950°F.

- Total Project Engineer, Sappi, Muskegon, Michigan. Study on 1350 PSIG, 900°F, 2,300,000 pound, black liquor solids per day recovery boiler and auxiliaries.

- Total Project Engineer / Project Manager, Sappi, Muskegon, Michigan. Technical coordination for project consisting of a 300,000-pounds per hour, 1350 PSIG, 900°F power boiler and a 25,000 kW turbine generator. The boiler fires pulverized coal and bark in suspension, with natural gas backup. Boiler is followed by a dry scrubber and electrostatic precipitator. Turbine generator has inlet steam conditions of 1300 PSIG, 900°F, and is a Single Automatic Extraction Non Condensing (SAENC) unit.

- Project Engineer, Confidential Client. Engineering and design on two turbine generators and their associated auxiliaries. Each turbine generator has inlet steam conditions of

1,325 PSIG, 925°F. One turbine generator is a Double Automatic Extraction Condensing (DAEC) unit rated at 61 MW. Second unit is SAENC rated at 43 MW. Responsible for operator training manuals for all project areas. Project included a 1,100-tons per day recovery boiler and a 685,000 PPH pulverized coal and biomass boiler.

- Project Engineer, International Paper Company, Georgetown, South Carolina. Design and engineering on two combination boilers rated at 425,000-pounds per hour steam (each) firing pulverized coal, bark, and oil with natural gas ignitors. Design and engineering included boiler auxiliaries such as air compressors, stock feeder, ductwork, drag conveyor, ash handling system, feedwater system, and dust collecting system. Project included two (2) 40 MW turbine generators and recovery boiler rebuilds.

- Power Engineer, International Paper, Sartell, Minnesota. Design and engineering on a combination boiler rated at 270,000-pounds per hour steam, firing coal, bark, and sludge, and related auxiliaries such as air compressors, stacks, and ash handling equipment. Also performed engineering on a 20,000 kW, 24,000 KVA, DAEC, back-pressure, air-cooled turbine generator and its associated auxiliaries.

- Power Engineer, Smurfit-Stone, Hopewell, Virginia. Design and engineering on a mill power plant expansion consisting of a 1,000-ton recovery boiler, a 500,000-pounds per hour steam combination boiler firing coal, bark, and hog fuel oil, and their related auxiliaries. Auxiliaries consisted of barrel boiler feed pumps, deaerator, air compressor system, demineralizers, polishers, No. 6 and No. 2 fuel oil systems, and miscellaneous equipment. Also responsible for design and engineering of a 35,000 kW, 56,000 KVA DAEC one uncontrolled extraction, condensing, hydrogen-cooled turbine generator and its associated auxiliaries.

- Power Engineer, Potlatch Corporation, Lewiston, Idaho. Design and engineering of a 9,220 kW, 12,875 KVA back-pressure, noncondensing, air-cooled turbine generator.

- Power Engineer, CIA Industrial, De San Cristobal, S.A., Mexico. Report and estimate for turbine generator expansion of bagasse mill.

- Power Engineer, Mead, Chillicothe, Ohio. Design and engineering on pump and auxiliaries and mill water study.

- Power Engineer, Potlatch Corporation, McGehee, Arkansas. Design and engineering on one (1) oil-fired 375,000-pounds per hour steam power boiler and related equipment, one (1) 20,000 kW, 32,000 KVA, SAENC turbine generator with related auxiliary equipment and No. 6 fuel oil system to supply oil to boilers.

- Power Engineer, Philip Morris USA, Bermuda Hundred, Virginia. Design and engineering on two (2) oil-fired 120,000-pounds per hour steam package boilers. Complete steam generating facilities with related pumps and auxiliaries.

Employment History

Jacobs 1973 – date

PEF-NCR-00355

Name: **JOSEPH S. DEMIDOVICH, JR., P.E.**

Title: **Sr. Civil/Structural Engineer**

Education: B.S., 1972, Civil Engineering, Case Institute of Technology

Registration: Professional Engineer, 1976, Florida, Nevada, Georgia, Michigan, Ohio, and North Carolina

Mr. Demidovich has over 34 years of experience, including 18 with Jacobs as a Sr. Civil/Structural Engineer. His structural steel, reinforced concrete, and civil engineering design/supervisory experience has been utilized in the design and construction of industrial plants serving the chemical, fertilizer, food, mining, petrochemical, plastics, synthetic fuels, metal, steel, paper, power, wood products industries and gypsum wall board industries. He has expertise in:

- Steel structures include multi-level buildings and towers, mill buildings, control houses, piperacks, conveyor galleries, multi-compartment hoppers, bins, crane runway systems, furnaces, large "preassemblies" involving overseas transport and site placement considerations

- Concrete structures include building, stack, and large equipment foundations such as large mats, pile caps, spread footings, ring walls, retaining walls, chemical containment basins, sumps and trenches.

- Civil work includes site preparation, drainage, dikes, underground piping/utilities, roads, bridges, and paving. Permitting with governmental agencies such as Southwest Florida Water Management District, Florida Department of Environmental Protection and State of Georgia Soil and Water Conservation Commission.

- Computer analysis includes use of programs such as STAAD (modeling both indeterminate building geometrics and finite element mat foundations), PCA mat programs, Ramsteel, site drainage programs – ICPR and Moderet, and personal computer programs.

- Supervision includes directing civil personnel, coordinating engineering problems with management, purchasing, scheduling, field, other design disciplines, vendors, and clients; developing layouts, plans, design criteria and specifications, manpower estimates, control schedules, status reports, and drawing lists; issuing drawings, bills of materials, and purchase requisitions; and reviewing bids.

Field engineering included a one-year job assignment on the methanol portion of a $2 billion gas-to-gasoline project. Responsibilities included overseas site liaison work and assisting construction managers, subcontractors, and quality control personnel; contract administration consisting of approving contractor requests and change orders; and directing the installation of utilities and roads under difficult soil conditions.

PEF-NCR-00356

Representative assignments include:

- DAP Revamp for PCS in Aurora, NC – 2005
- 120 Ton/hr DAP Plant for OCP, Jorf Lasfar, Morocco
- Clean Air Access Roads and Drainage Project for Progress Energy, Crystal River
- Pure Acid Expansion Project for PCS in Aurora, NC – 2004
- Phosphoric Acid Plant Revamp for PCS in White Springs, FL
- Homeland Security Roads Project for Progress Energy, Crystal River, FL
- Gypsum wallboard expansion for PABCO Gypsum – 2004
- Gypsum wallboard wrap around expansion for PABCO Gypsum – 1998
- Phosphate Beneficiation Plant for CF Industries Inc.
- Lonesome Beneficiation Plant for IMC-Agrico, Lithia, FL
- Phosphate beneficiation plant upgrade for Mulberry Phosphates
- BIDCO feasibility study of the rehabilitation of the Linden, Guyana bauxite operations
- Dredge boom structural analysis for Standard Sand & Silica
- Four Corners Mine for W.R. Grace/IMC
- Phosphate rock beneficiation plant for CF Mining Corp.
- Coal beneficiation plant for U.S. Steel Corp.
- Sinter plant for Bethlehem Steel Corp.
- Sodium Chloride Plant for Sterling Pulp Chemicals, Ltd., in Muswellsbrook, Australia
- Scrubber Project for OCP, Safi, Morocco
- Pure Acid Expansion Project and Scrubber Project for PCS in Aurora, NC – 2001
- Wet Rock Grinding Conversion for CFI
- Phos Acid Reactor Encasement for IMC-A
- Pharmaceutical lab for IDDS in Miramar, FL
- Brine slag handling, compressor and pond modification projects for TECO
- Structural modification for Minute Maid Plant in Dunedin, FL
- Space Station processing facility for NASA at Kennedy Space Center, FL

- Phosphoric Acid Reactor Encapsulation Study for Serrana in Cajuti, Brazil
- Phosphoric acid debottleneck for PCS in Aurora, NC
- Phosphoric Acid Reactor, Oswal Chemicals and Fertilizers Ltd., Paradeep, India
- Two phosphoric acid plants for CNCCC in China
- Phosphoric acid plant for Chevron Chemical Co.
- Phosphoric acid upgrade for Texasgulf Inc.
- Phosphoric acid and granulation plants for Valley Nitrogen Producers Inc.
- Pharmaceutical Fine Chemicals, Sodium Naproxen Project, Freeport, Grand Bahamas
- LaRoche Industries Inc., Ammonia Nitrate and Nitric Acid Plant Upgrades, Cherokee, AL
- Sterling Pulp Chemicals, Ltd. Sodium Chlorate Plant, Valdosta, GA
- The Ledger Newspaper Printing Facility Redesign at Lakeland, FL
- Pharmaceutical plant for Syntex Pharmaceutical International Ltd., Freeport, Grand Bahamas
- HPAO project for Uniroyal Chemical Co., Freeport, Grand Bahamas
- Apache Nitrogen Products Inc. Reactivation of a Nitric Acid Plant
- 240-foot span A-frame storage building for Rhone-Poulenc Inc. at Green River, WY
- Steamline project for Texasgulf at Aurora, NC
- The Ledger Newspaper printing facility at Lakeland, FL
- Building renovation for Coca-Cola Foods at Auburndale, FL
- Belt filter building and evaporator additions to J.R. Simplot's phosphoric plant in Pocatello, ID
- Catalyst restoration plant for BP Chemicals in Lima, OH
- Oakbridge Land Development, a commercial/residential project
- Ultem-plastics plant for General Electric Co.
- Oil refinery for Kukdong Oil Co., South Korea
- Board plant for Georgia-Pacific Co.
- Methanol plant for New Zealand Synthetic Fuels Corp. and Mobil

- Aluminum continuous casting and rolling mill for Reynolds Metals Co.
- Polypropylene film plant for Hercules Co.
- Paper products converting plant for Procter & Gamble Co.
- Sulfur dioxide recovery unit for Getty Refining and Marketing Corp.
- Styrene-monomer plant for Rubicon Co.
- Coal liquification plant for SASOL II in South Africa
- Copper refinery for Cerro Steel Corp.
- Coke oven batteries for Inland Steel Co.
- Basic oxygen furnaces for Bethlehem Steel Corp.
- Wet rock grinding plant for Royster Co.
- Formaldehyde plant for Celanese Co.

Employment History:

Jacobs Engineering Inc. Civil/Structural Engineer	1988 to date
Drummond Coal Co. Civil/Structural Engineer	1986 – 1988
Badger Engineers, Inc. Civil/Structural Engineer	1984 – 1986
Baymont Engineering Co. Civil/Structural Engineer	1984 – 1984
Davy McKee Corporation Civil/Structural Engineering	1979 – 1983
Contract Status for Varying Engineering Companies	1977 – 1979
Badger Engineers, Inc. Civil/Structural Engineer	1974 – 1979
Dravo Corporation Civil/Structural Engineer	1973 – 1974
Koppers Company Civil/Structural Engineer	1972 - 1973

Name: **FRANK S. HICKS**

Title: **Manager of Minerals Beneficiation Projects**

Education: B.S., 1971, Chemical Engineering, Georgia Institute of Technology

Affiliation: American Society of Mining and Metallurgical Engineers

Mr. Hicks has worked in the phosphate industry for over 30 years in both plant operations and as an industry consultant. He is Jacobs Manager of Minerals, Beneficiation Projects responsible for review and approval of minerals beneficiation projects. His duties include development of internal programs to develop and apply new minerals beneficiation technology, improved plant performance, plant testing, process modifications, development of process design and computer applications for process analysis, and evaluation of process alternatives, feasibility studies, and process selection. Mr. Hicks is also responsible for the definition and mitigation of environmental impacts of mining and waste disposal.

Representative assignments include:

- Lead Process Engineer for Mobil South Fort Meade mine, 3.4 million TPA and CF Industries Hardee County Relocation and Expansion, 3.5 million TPA mine.
- Lead Process Engineer for IMC Consolidated Mine Project.
- Lead Process Engineer for IMC Lonesome Mine 3.0 million TPA.
- Lead Process Engineer for IMC-Agrico Lonesome Beneficiation Plant, 2.5 million TPA.
- Process engineering for Cargill's expansion of South Fort Meade Mine including PFD's and P&ID's.
- Process development including metallurgical and pilot plant studies, process simulation, process economics, optimum equipment size, type, and service requirements.
- Review and approval of process configuration, base data and design for four new mines in Florida including a 2 million TPA mine for Farmland; a 3 million TPA mine for Mississippi Chemical Corporation; a 1.5 million TPA mine for USSAC, Fort Meade Extension; and a 3 million TPA mine for AMAX.
- Project Manager for pilot plant evaluation of magnesium levels and phosphoric acid manufacture for W.R. Grace.
- Process engineer for Georgia Pacific wallboard expansion project in Savannah, GA.
- Process engineer / Project Manager for gypsum beneficiation capital cost estimate for PABCO in Las Vegas, NV.
- Process engineer for detailed design of PABCO gypsum beneficiation plant.
- Process / equipment Engineer for preparation of a budget grade estimate for a gypsum wallboard expansion project for Domtar Gypsum in Sweetwater, Texas.
- Process Engineer / Project Manager for preliminary design package, which culminated in an estimate by the client for a $10 million specialty chemical plant.
- Process Engineer for Fertinal Beneficiation Plant expansion at San Juan de la Costa.

- Process Engineer for utilities area for Astaris Purified Phosphoric Acid Plant.
- Process Engineer for water retention pond modifications at TECO's Gannnon Plant.
- Project Manager / Investigator involved with several capital cost estimates for both chemical plants and mines in the central Florida area.
- Participated in due diligence evaluations for asset acquisitions for PCS, Cargill, and Mulberry phosphates. Evaluated assets and environmental liabilities during the course of those studies.
- Feasibility study participation and various studies for new mining ventures which include the Mexican, Colombian, Saudi Arabian, and Chinese phosphate projects, western phosphate deposit studies, and local Florida projects.
- Project Manager for feasibility study for the utilization of Tunisian wet phosphate rock and the manufacture of phosphoric acid.

In previous employment with Mobil Chemical Company at their Florida Phosphate Operations, he served as Senior Process Engineer. In this role, he was responsible for various aspects of the evaluation and improvement of existing operations. This work included plant testing, process modifications, and bench and pilot plant testing to improve existing process performance in two mining and beneficiation plants. Mr. Hicks worked on a semi-industrial scale waste clay settling project. He also developed computer programs for evaluating plant data to define operating costs as a function of plant conditions. In addition, he developed a program to report routine plant performance results.

He served as process engineer for Mobil on South Fort Meade mine development task force. His duties included process definition, permitting support, and client representative during preliminary engineering.

At Deering-Milliken Inc., he worked in production supervision and process engineering.

Publication:

"The Effect of the Environmental Permitting Process on Florida Phosphate Mining," with M.E. Zellars, March 1983, AIME Meeting in Atlanta, Georgia

Employment History:

Jacobs Engineering Group Inc. Manager of Minerals Beneficiation Projects	1981 to date
Mobil Chemical Company Senior Process Engineer	1976 - 1981
Deering-Milliken Inc. Production Supervisor Process Engineer	1971 - 1975

Name: **NAN JORDAN**

Title: **Ecological Sciences and Environmental Project Management**

Education: Graduate Studies in Zoology, University of South Florida
University of South Florida
Florida Institute of Government Executive Fellows Program
B.A., Biology, University of South Florida, 1981

Ms. Jordan has over 24 years of experience in the environmental field including 15 years with the Department of Environmental Protection and 6 years with major international and local consulting firms. Her expertise includes environmental permitting, NEPA coordination, and Section 7 Consultation, ecosystem restoration, project management, mitigation construction project management and regulatory compliance specializing in wetlands, wildlife, water quality, aquatic ecology, and mitigation.

Representative assignments include:

- Magnolia Bay Marina and Resort, Secret Promise, Ltd., Keaton Beach, Florida and State, Environmental Project Manager. Project Manager for Environmental Resources Permit application coordination, field assessments and response for information requested from state and federal environmental agencies. Assisted in team oversight including the coordination of submittals from the design team work products and schedule. 2006-2007
- Lake Griffin SWIM Restoration Project, Lake County Water Authority, Environmental Project Manager for the permitting of the restoration of Lake Griffin in Lake County, Florida. The project involves suction dredging flocculent sediments from 29 canals surrounding Lake Griffin, to improve water quality, filter marsh treatment of discharge from the dredge material containment area and the restoration of a portion of the historic shoreline of Lake Griffin owned by the St. John's River Water Management District. Responsibilities included field inspections for wetlands, surface waters, threatened and endangered species; permit application preparation and processing, ERP and USACE permit coordination and negotiation meetings. 2001-2002
- CW Bill Young Reservoir, Tampa Bay Water, Construction Project Manager for the construction of the mitigation involving approximately 450 acres of wetlands that were created or enhanced and over 600 acres of upland areas that were enhanced and preserved. The mitigation was located on three separate areas to the east, north and west of the reservoir embankment, throughout the 5,200-acre site. These mitigation areas include restoration of agricultural land and the planting of over 1.5 million herbaceous plants, shrubs and trees. Responsibilities included oversight of construction compliance inspections for all environmental issues related to the project including mitigation construction, water quality threatened and endangered species, environmental permit compliance and agency coordination. 2002 – 2004
- US Highways 1 and 84, Georgia Department of Transportation. Environmental Project Manager for comprehensive terrestrial surveys for the presence and abundance of the eastern indigo snake, gopher tortoise and other xeric/scrub species along a half mile wide corridor for approximately 40 miles of roadway near Waycross, Georgia.
- Transportation Project Development and Environment Studies, Environmental Project

Manager for wetland evaluations threatened and endangered species assessments and water quality assessments required complying with NEPA, USFWS and FHWA requirements. Provided oversight of environmental project and sub consultant team regarding field reviews, agency coordination, document production and quality assurance/quality control (QA/QC). Select projects include:

- FDOT District One, I-75, PD&E Study, from north of Kings Highway to River Road, Charlotte, DeSoto and Sarasota Counties, Florida;
- Florida Turnpike Authority, State Road 528/Bee Line West Expressway PD&E Study from Interstate 4 to McCoy Road, Orange County, Florida
- FDOT, District One, I-75, PD&E Study, from SR 951 to the Lee/Collier County Line, Collier County, Florida
- FDOT, District One, I-75 PD&E Study from River Road to SR 681, Sarasota County, Florida
- FDOT District Five, SR 46 from PD&E Study from SR 15/600 to SR 415.
- FDOT District Seven, I-75 PD&E Study from Fowler Avenue to County Road 54, Hillsborough and Pasco Counties, Florida
- FDOT District Seven, Gandy Boulevard PD&E Study, U.S. Highway 19 to east of 4th Street, Pinellas County, Florida
- FDOT District Seven, I-4 PD&E Study, Polk County, Florida
- Jacksonville Transportation Authority, Heckscher Drive (SR 105) Phase II, PD&E Study, from Drummond Point to August Drive, Duval County, Florida
- Limited Access Corridor Study, FDOT District Three. The study area included a broad corridor from Panama City Florida to Dothan, Alabama and traversed Bay, Jackson, Holmes, and Washington Counties in Florida. Geographic Information System (GIS) data were used to determine the location of sensitive natural resources including listed species, wetlands and preservation and recreation lands and to develop three alternative corridor alignments that would avoid or minimize impacts. Responsibilities included environmental project management, agency coordination, document production and QA/QC.
- Old Fort King Trail, Hillsborough County, Environmental Project Manager for the permitting and design of 6.5 miles unpaved trail for equestrians, hikers and off-road bikes, and 2 miles of paved trail, and trail head parking and pavilions. Provided environmental project management services to obtain state, federal and local environmental permits including mitigation design, land acquisition and agency coordination.
- Transportation Permitting, Environmental Permitting and Mitigation Contract with FDOT District One Environmental, Project Manager for the General. Responsibilities included conducting wetland delineations, wildlife surveys, boat surveys; preparing ERP and US Army Corp of Engineers permit applications, agency coordination and in-house training of FDOT staff. Projects included:

- SR 31, Desoto County, Florida
- US 27, Polk County, Florida
- SR 70, Desoto and Okeechobee Counties, Florida
- Judge Jolly Bridge (SR 951) over the Marco River in Marco Island, Florida
- SR 62, Hardee County, Florida
- Southwest District State of Florida Department of Environmental Protection, Environmental Manager for the Environmental Resources Permitting, Compliance and Enforcement Program. She also served in numerous other roles including ombudsman for the northern counties of the district, and chairman of numerous state and district-wide committees. During her tenure with the Department, she was responsible for the following activities: (1985 to 2000)
- Development and implementation of the statewide procedures and penalty guidelines for the FDEP ERP compliance and enforcement program.
- Statute and rule development for trimming and alteration to mangroves.
- Supervision of wetland dredge and fill and ERP applications assessment.
- Management of the Southwest District Environmental Resources Compliance and Enforcement Program.
- Intergovernmental coordination to provide conflict resolution to citizens, elected officials, and county and local governments for environmental issues that were not resolvable through conventional Department mechanisms;
- Liaison to the legislative delegation and county commissions for Pasco, Hernando, Citrus, Sumter and Marion.
- Coordination with county governments to eliminate conflicting and duplicative requirements and prohibitions that resulted in inefficient government or placed hardships on the citizens;
- Provided public outreach and participation opportunities designed to create partnerships between the public and the FDEP.
- Developed of and chaired the Southwest Florida Environmental Crimes Task Force attended by appointed representatives from the US Attorneys Office, the US Department of Justice, the US Coast Guard, the EPA Criminal Investigations Divisions, and state and local attorney's offices, and environmental crimes investigators.
- Managed the FDEP Southwest District Water Chemistry Laboratory and the Ambient Water Quality Laboratory
- Provided expert witness testimony regarding wetlands, water quality, and environmental regulations.

Name: **HARISH H. SHAH, P.E.**

Title: **Manager – Mechanical and Piping Engineering**

Education: B.S., 1971, Mechanical Engineering, Tuskegee Institute
M.S. 1978, Engineering Administration, University of South Florida

Registration: Professional Engineer: FL, GA, MA, TN, ID, NC, SC

Affiliation:
FES: Florida Engineering Society
NSPE: National Society of Professional Engineers
ASHRAE: American Society for Heating, Refrigeration, and Air Conditioning Engineers
Past President FES Ridge Chapter – 1983-84
Nominee-Engineer of the Year-1997 FES Ridge Chapter

Mr. Shah has over 34 years experience in mechanical engineering and all areas of technical job management, plant design, HVAC, plumbing, project management, facilities engineering, maintenance management, client liaison and project coordination. Experience also includes supervising engineering and design personnel, coordinating work with other disciplines, writing specifications, engineering calculations, manhour estimates, schedules and construction cost estimates.

Projects include phosphate fertilizer plants, industrial manufacturing facilities, high rise office buildings, schools, department stores, swimming pools and other industrial, commercial and institutional projects. Record of progress to increasing responsibilities including project engineering and project management.

As the Mechanical and Piping Engineering Manager, Mr. Shah is responsible for the administrative supervision of all personnel in the department, assignment of engineers and designers to different projects, review project design, calculations, specifications and drafting activities for quality control on each project.

Representative assignments include:

- PMP – Phosphoric Acid Plant at Jorf Lasfar in Morocco
- PCS – DAP II Revamp Project at Aurora, North Carolina
- Tropicana – Design of a new wet end facility in Bradenton, Florida
- Mosaic – Lonesome Central Screening Station, Lithia, Florida
- OCP – 120 TPH DAP plant in Morocco & 1 TPH Pilot plant in Morocco
- OCP – New Phosphoric Acid Plant at Jorf Lasfar in Morocco
- PCS – Purified phosphoric Acid plant located at Aurora, North Carolina Train 3 & 4
- MAADEN – Feasibility Study for DAP Plant and Beneficiation Plant in Saudi Arabia
- OCP – SO2 scrubbing project and granulation plant modification project

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- Sterling Chemical – Sodium Chlorate plant located at Muswellbrook, Australia
- RPP – Several small projects including but not limited to Steam distribution system analysis, Instrument loop diagrams, Reactor relief valve and rupture disc replacement, Tank T-16 agitator replacement, etc.
- FMC – Purified Phosphoric Acid Plant located at Soda Springs in Idaho
- C F Chemical - Wet rock grinding modifications to acidic pond water system at Plant City, Florida
- Shell Chemical Co. - Several small projects including Instrument Loop and data base creations, Relief valve sizing on reactors and hot oil system, Preparing SGM's (Safe Guarding Memorandums) etc.
- Tampa Electric Co. – Several small projects including Gannon Bayside waste water pond water modification, Compressor installation etc.
- W. R. Grace – Phosphate Beneficiation Plant located at Hookers Prairie and Four Corners in Polk County, Florida
- C F Chemical Co. – Phosphate Beneficiation Plant in Hardee County in Florida
- IMC Corporation – Granulation Plant and Animal Feed Ingredients Plant at New Wales
- Barnett Tower – Twenty-seven story high-rise office building
- FDLE – Two story office and crime lab building for Florida Dept. of Law Enforcement
- Dillards – Eight thousand square foot stores in Orlando, Lakeland, Naples and Ft. Myers
- Polk County School Board – Polk Opportunity Center, Chapter 1 admin. Bldg. SSS bldg.
- Hillsborough County School Board – Tampa Palms Elementary School
- Hillsborough County School Board – Westside Elementary School
- Highlands County – Highland County Jail Renovation of existing jail and addition to existing jail complex Sarasota County Jail Design of new jail complex including food service facility
- Osceola County School Board – Osceola County Design of a new elementary school
- Honeywell Corporation – Renovation of existing facility and addition to existing manufacturing complex
- Namhae Chemical – Granulation plant in Korea
- New Mexico Power – SO2 recovery system

Name: **THOMAS C. SMITH, PE**

Title: **Senior Electrical Engineer**

Education: B.S., Electrical Engineering, University of Florida, 1987

Registration: Registered Professional Engineer, Florida, North Carolina

Mr. Smith has over eighteen (18) years of project management, design and construction management/start-up experience on chemical, pharmaceutical, pulp and paper, power generation and institutional projects. He has been a lead engineer on a variety of projects ranging from technical studies to full service EPC projects. His technical strengths are in power distribution, motor control, lighting, DCS/PLC interface, equipment specifications, calculations and studies. He is responsible for technical quality within the E&I department. Lead engineer responsibilities include development of professional service and total installed cost estimates, procurement of equipment and installation subcontracts, inspections and construction support. His ability to adapt to any assignment or environment is proven through the diversity of his experience. He has proficiency with several software packages including Microstation/Intergraph, AutoCAD, Microsoft Office Suite, EDSA and SKM Power Tools electrical calculations.

Representative assignments include:

- PCS Phosphate, Purified Acid Aurora, NC. Lead electrical engineer on the EPC project team responsible for the design, procurement and construction of an expansion to an existing purified phosphoric acid production facility. Project includes 25kV power distribution with 5000kVA transformers, electrically hazardous areas, subcontract and equipment procurement, and construction support.

- PCS Phosphate, HFSA/STF Aurora, NC. Lead electrical engineer responsible for the design and procurement on project to increase production of HFSA for feed to new production area producing STF. Expansion of HFSA production includes conversion of plant to A-B Control Logix PLC control and overhaul of motor control center with new GE Evolution MCCs including DeviceNet interface with PLC for motor control. New STF area includes 1500KVA substation with 3200A switchgear, A-B MCCs using DeviceNet control, A-B Control Logix PLC, lighting, grounding and heat tracing.

- Fauji Fertilizer, DAP Revamp Karachi, Pakistan. Electrical engineer responsible for the development of single line diagrams, load study and equipment specification associated with a conceptual engineering package for 50% increase in plant production. Design required evaluation of existing plant single line diagrams and equipment drawings to recommend upgrades to support project goals. Equipment based on IEC and metric standards.

- Mosaic, Lonesome Screening Station Lonesome, FL. Registered engineer responsible for the electrical and controls design of a phosphate ore screening station. Project required 69KV utility feed and 4160V and 480V distribution systems. Equipment included double-ended 10MVA substation and 2000A Siemens switchgear. Plant controls used A-B Control Logix PLCs.

- PCS Phosphates, DAP Revamp, Aurora, NC. Engineer supporting plant revamp including process and material handling upgrades. New 480V motor control centers and upgrade from single loop control to plant-wide DCS system. Project included production of entirely new drawing package for the plant electrical and instrumentation systems.

- PCS Phosphates, Phosphoric Acid Plant - Direct Blend, Aurora, NC. Engineer responsible for electrical and instrumentation systems associated with a land reclamation system. Project required additions to the existing plant PLC and 350HP Variable Frequency Drive (VFD).

- Kellogg Distribution Center, Tampa, FL. Produced electrical study for addition of a back-up power generator to the facility 1200Amp power distribution system.

- Saudi Arabian Phosphate Consortium, DAP and Beneficiation Plant, Saudi Arabia. Responsible for development of Motor Control Center (MCC) single line diagrams and +/- 10% cost estimate. MCCs include medium and low voltage with process control interface. Estimate required detailed take-off of materials required.

- US Agri-Chemicals, DAP Fertilizer Facility, Bartow, FL. Electrical and controls engineer on the design associated with an upgrade to the ball mills and the oversized and fines conveyors. Upgrade included replacement of the mills from a chain type to ball type, an increase in HP for the variable speed conveyors and addition of diverter gate. Controls and instrumentation included a scale and position meters in the control room.

- US Agri-Chemicals, MAP Fertilizer Loadout, Ft. Meade, FL. Electrical and controls engineer for the design associated with finishing/polishing screen and an upgrade to the conveyors associated with railcar loading facility. Upgrade included MCC modifications, lighting and grounding of the screen structure and conveyor controls.

- PCS Phosphates, Purified Phosphoric Acid Facility, Aurora, NC. Lead electrical engineer on the EPC project team responsible for the design, procurement and construction of an expansion to an existing purified phosphoric acid production facility. Recently completed total installed cost (TIC) estimate. Project includes 25kV power distribution, 4-2500kVA transformers, electrically hazardous areas, subcontract and equipment procurement, and construction support.

- Florida Power Corporation, Crystal River, FL, Lead electrical and controls engineer on the plant drain renovation project for units 4 & 5. The project included 3 pumping stations using soft starters and variable frequency drives. Controls involved capacitance type level switch with multiple set points and alarms for variable flow application.

- Petersen Industries, Lake Wales, FL. Electrical engineer for the design associated with the relocation of a 100,000 sq. ft. manufacturing facility. Required new electrical service, utility stations, lighting, grounding and electrical systems for paint booths.

- Resolution Performance Products (RPP), Lakeland, FL. Performed a survey of the power distribution system that will result in single line diagram validation, load study using Excell, inspection report and maintenance recommendations.

- OCP, Safi, Morroco. Sulfuric Acid Scrubbing. Designed electrical systems associated with addition of a 2-train scrubbing system to their existing sulfuric acid production facility.

- Astaris Corporation, Purified Phosphoric Acid Facility, Soda Springs, ID. Lead Electrical Engineer responsible for electrical systems design and construction associated with a new phosphoric acid production facility. Responsibilities include project scope, estimate, equipment and subcontract procurement, management of engineering and design staff and construction support. Project required new utility substation (46kV-13.8kV), 4 secondary unit substations and modular power centers with MCCs, UPS and heat tracing systems. Motor control requirements include MV controllers, VFDs and DCS interface with local control. Project included hazardous areas, lighting, grounding and lightning protection.

- Tampa Electric Co., Polk Power Station, Mulberry, FL. Electrical Engineer responsible for design associated with the installation of a 1250HP compressor and entrainment separator (scrubber). Project required the installation of pumps, lube oil system, Bently-Nevada vibration monitoring. System was controlled with plant DCS and hardwired interlocks requiring instrument/control wiring and I/O assignment coordination with existing Bailey DCS. Responsible for maintaining engineering cost and schedule, writing specifications and checking detailed design.

- Merck & Co., Inc. Pharmaceutical Production Facility, Westpoint, PA. Electrical Engineer responsible for systems design associated with new wet milling, processing and encapsulation process. Project required the renovation of 3 areas within an existing production building, including Class 1, Division 2 hazardous areas. Process requires the addition of new 800A Motor Control Center (MCC) employing Variable Frequency Drives (VFDs) for the control of vessel agitators. System control will be through networked Programmable Logic Controllers (PLCs) requiring extensive instrument wiring.

- Eli Lilly, Packaging Facility, Indianapolis, IN. Electrical Engineer assigned to conceptual design team that generated design criteria narrative and +/-15% Total Installed Cost (TIC) estimate. Project will design 100,000 square foot pharmaceutical packaging facility on an existing Eli Lilly site. Facility includes 5 packaging lines, material staging/storage, administrative offices and QA/QC offices. Requires 3-800A feeders from existing substation serving two MCCs and one distribution panel. Design includes systems for Class 'A' clean fill areas.

- Schering-Plough, Pharmaceutical Production Facility, Mexico City, Mexico. Electrical Engineer responsible generating Basis of Design (BOD) and +/-15% TIC estimate for new sterile packaging facility in an existing production building. BOD required evaluation of existing normal and emergency power distribution scheme, preliminary equipment layout and electrical systems narrative. Emergency power generation required load analysis for adequacy of existing generator. Design requires systems for Class 'A', clean room areas with pre-manufactured wall and ceiling systems (Clestra) while complying with cGMP standards.

- Merck & Co., Inc. Pharmaceutical Production Facility, Westpoint, PA. Electrical Engineer. Served on study team that inspected and documented observations of three production buildings. Inspection covered compliance with governing codes and cGMP

issues. Developed binders that documented product, personnel and waste flow within the facility, general guidelines for compliance to industry codes and standards, and programming data sheets detailing our findings.

- Merck & Co., Inc. Pharmaceutical Production Facility, Westpoint, PA. Electrical Engineer. Produced construction documentation for modifications to a veterinary building. Scope included the relocation of a 400A distribution panel, installation of two new 400A feeders from two new distribution transformers and installation of new wet location lighting. Engineering required load analysis of existing facility to confirm new transformer loading and inspection of electrical installation for code compliance.

- Boehringer-Ingelheim Chemical, Inc., Bulk Production Facility, Petersburg, VA. Electrical Engineer. Generated conceptual design narrative for site-wide expansion of the facility infrastructure and production areas. Expansion includes new bulk production building with support wing, waste water treatment plant, lab and warehouse expansion, hazardous waste incinerator and administration building. Site development includes new redundant electrical service, distribution loop and emergency generators with peak shaving capability. Engineering required preliminary power distribution layout and load analysis to support conceptual cost estimate.

- NBC. Rockefeller Center Office Building and Studios, New York, New York. Electrical Engineer for two modification packages. Developed options for bypassing Con-Edison (utility) tie feeders within transformer vault networking rooms. Design of by-pass involved detailed survey of existing bus work and cable risers within network rooms and selection and design of power bus fittings, and splicing and cable support materials. Produced construction documents to install an additional parallel power feed for increased capacity of a switchboard main due to harmonic overload concerns.

- Merck & Co., Inc. Bulk Chemical Manufacturing Plant, Rahway, NJ. Lead Electrical Engineer. Responsibilities include budget and schedule management, specification writing, equipment selection, calculations and studies, and the design of power distribution, motor control, PLC (Modicon) interface, lighting, and grounding systems for hazardous areas. Systems design includes ABB 1500kVA double-ended substation fed with a medium voltage overhead line, Square D Motor Control Centers (MCCs) with Variable Frequency Drives (VFDs) and PLC interface, hazardous area lighting and instrumentation and controls. Services include development of projects from conceptual design through construction assistance and systems start-up.

- NBC. Rockefeller Center Office Building and Studios, New York, New York. Worked on a power distribution upgrade project. Tasks included distribution of power from utility service vaults through switchgear to floor circuit breaker panels. Analyzed existing loads for sizing of new GE switchgear requiring detailed field surveys of existing conditions. Provided layout of feeders in congested overhead spaces while considering minimal down time due to reconnection of loads to new switchgear.

- Kimberly Clark. Field Services, Owensboro, KY. Responsibilities included electrical engineering support of systems checkout prior to start-up of new paper towel plant. Tasks required data collection, control system tuning, and instrumentation calibration during water runs. Gained experience with Honeywell TDC operator interface, Modicon

PLC, GE AF-300 series drives, and Honeywell smart transmitters as applied to chemical additive systems.

- Westvaco. Activated Carbon Production Facility, Wyckliffe, KY. Responsible for the design of electrical systems associated with the facilities' office and maintenance buildings, plant utility systems (potable water, fire water, etc.), truck weigh scales, fiber optic data highway and voice systems. Provided construction documents including power and control plans, instrumentation loops, motor control elementaries, MCC layout and procurement, and lighting plans. Specified fiber optic and specialized cabling, Allen-Bradley MCCs, lighting, and instrumentation/control devices which required coordination with vendors.

- Union Camp Corporation. Design Engineering and Field Services, Savannah, GA. Produced construction documents that required field verification of existing plant systems for the installation of three sump pumps in a highly corrosive area and a mill wide addressable fire alarm system (Pyrotronics). Pump controls involved ultrasonic level sensing, AB 1336 Plus drives, and Bailey DCS interface. Drawings required tray layout, panel layout, device specification, cable scheduling.

- Owens Corning. Roofing Plant Field Services, Savannah, GA. Construction Manager for capital improvements and Field Engineer for maintenance projects and technical writing. Capital projects included replacement of asphalt holding tanks, new plant sewer system tie-in to municipal system, and burner management and control systems. Produced plant "Total Energy Lockout Procedures" requiring full working knowledge of plant processes and electrical distribution system. Sewer system utilized Flygt pumps with Foxboro flow meter and chart recorder controls. Asphalt burner management and preheater controls utilized Honeywell UDC controllers and Tru-line chart recorders.

- Bechtel Power Corporation, Gaithersburg, MD.
  Assigned to a variety of jobs in the power generation industry. Lead engineer on site during start-up of 2-300 MW combined cycle units at FPL's Martin County generating station. Primarily responsible for the coordination and start-up of controls between Bechtel engineered systems and General Electric engineered turbine/generator systems. Produced over 200 schematics using AutoCAD, which showed the complete functionality and connections between the turbine/generator equipment and the balance of plant controls using Bailey DCS. Drawings were used for installation of cabling, systems checkout, and start-up.

- Worked for the Special Projects group in the Chicago, IL office supporting 6 Commonwealth Edison nuclear power plants. Worked on several technical studies and modification projects including the functional review of over 1500 safety-related motor operated valves (MOVs) at the 6 sites. Tasks included review and update of equipment specifications and operating procedures, and production of construction packages for modifications to MOV power and control circuitry. Produced and maintained an equipment and calculation database for all the MOVs reflecting voltage drop calculations, thermal overload sizes, motor feeder sizes and valve motor torque requirements. Generated modification packages, which included equipment bills of material, motor power and control upgrades, regulatory compliance documentation, and start-up/testing procedures.

- Electrical engineer on design team supporting a major boiler overhaul of FPL's Cape Canaveral Unit No. 1. Responsible for modification packages affecting instrumentation and control systems for the boiler and turbine/generator control systems including upgrades to hydrogen detection system and Bentley-Nevada vibration detection system. Produced bills of material and contractor installation packages, developed operating and maintenance procedures and supported start-up.

Additional related experience includes:

- Project Manager and Electrical Engineer on industrial and institutional projects with Ralph Hahn and Associates in Orlando, FL. Offered prime consulting services to governmental clients and engineering services to architectural clients. Responsibilities ranged from construction budgeting through design to construction management and turnover. Worked with clients on project budgeting and scheduling, equipment specification and acquisition, and code compliance. Engineering services included construction document production with AutoCAD, engineering analysis and studies, lighting, raceway and equipment layout, fire protection and detection and HVAC controls. Projects included new chemistry labs at the University of Central Florida, modifications to Titusville High School, clean room facilities in Hanger 'P' at Cape Canaveral Air Force Base, and telecommunications upgrades to Nocatee Elementary School specifying Category 5 equipment.

- Electrical Engineer with Ralph Hahn and Associates, West Palm Beach, FL. Responsible for systems design on a variety of institutional and governmental projects. Projects included the construction of three new high schools in Palm Beach County. Systems involved power distribution, lighting conforming to state requirements, voice/data systems, fire protection conforming to NFPA codes and CCTV. Responsibilities include equipment specification, design engineering, construction management, cost estimating, and vendor coordination.

- Design engineer with Actech Architects and Engineers in Jacksonville, FL. Responsible for production of construction documents using AutoCAD software. Projects required layout and sizing of electrical power distribution equipment, generator, lighting and facility communication. Required conformance to NEC, NFPA and Life Safety Codes for modifications to the City of Jacksonville's Performing Arts Center and Coliseum. Modifications and Upgrades involved the addition of emergency lighting and consolidation of emergency loads at the Coliseum and Upgrades to the stage lighting dimmer racks and fire protection systems at the Performing Arts Center.

Name: **WILLIAM E. ZEIGLER**

Title: **Manager of Project Controls**

Education: B.S., 1971, Building Construction, University of Florida

Certification: Certified General Contractor, Florida

Affiliation: American Association of Cost Engineers

Mr. Zeigler has 36 years of experience, including 14 years with Jacobs, serving as the Manager of Project Controls. He has held positions in planning and scheduling, cost control, estimating, procurement, field supervision, and various construction trades, providing him with a unique depth of experience to draw from in establishing and maintaining project controls systems. He has extensive experience with computerized project controls, both in custom applications and leading software products. Mr. Zeigler's experience in estimating includes the development of all grades of estimates from factored estimates to detailed, control-grade estimates. His experience in cost control is extensive and includes superior aptitude in scope management and early cost trending for pro-active cost control. Mr. Zeigler's experience in planning and scheduling includes inter-active planning, development of detailed schedules, application and leveling of resources, establishment of tracking systems for determining physical progress, and design and implementation of various reporting systems.

Representative assignments include:

- Mosaic Industries Central Screening Station
- Cargill beneficiation capital projects
- IMC beneficiation capital projects
- OCP New DAP Expansion, Morocco
- FMC/ ASTARIS phosphoric acid plants
- IMC-Agrico Multifos expansion
- Pabco Gypsum Facility Expansion
- CF Industries belt filter expansion
- Shell Chemical resins expansions and upgrades
- U.S. Agri-Chemicals MAP plant and shipping facility
- LaRoche NA Upgrade & AN Prill Fattening expansion
- W.R. Grace beneficiation facility
- TA Minerals beneficiation facility
- Celanese cogeneration facility
- Texasgulf ammonia scrubbing modification

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- U.S. Army remedial action environmental projects
- U.S. Army Corps of Engineers Hurricane Andrew recovery project
- AFCEE remedial action environmental projects
- IMC Fertilizer environmental containment project
- CNCCC DAP production facility
- CNCCC phosphoric acid production facility
- BP MTBE production facility
- Mobil methanol production facility
- IMC phosphoric acid facility
- IMC-Agrico phosphoric acid plant expansion
- Occidental Chemical phosphoric acid and port facilities
- CF Industries beneficiation facility
- Anchor Glass facility improvements
- The Ledger newspaper production facility
- Syntex pharmaceutical facility improvements
- Apache Nitrogen facility expansion
- Albright & Wilson laboratory facility expansion
- Albright & Wilson product improvement and turn-around
- Breed Industries production facility expansion
- Sterling Pulp Chemical sodium chlorate plant
- DOMTAR gypsum board production plant expansion.

Mr. Zeigler's procurement and material control experience involved numerous large industrial projects where his duties included budgeting, scheduling, supervising, coordinating and troubleshooting the procurement effort as a lead member of the project team.

Mr. Zeigler has experience on a number of commercial and large residential construction projects, where his duties included estimating, procurement, subcontract administration, office management, field supervision and project management.

Employment History:

Jacobs Engineering Group Inc. 1993 to date
Manager of Planning and Scheduling

Phillips & Jordan, Inc. 1992 - 1993
Cost Engineer

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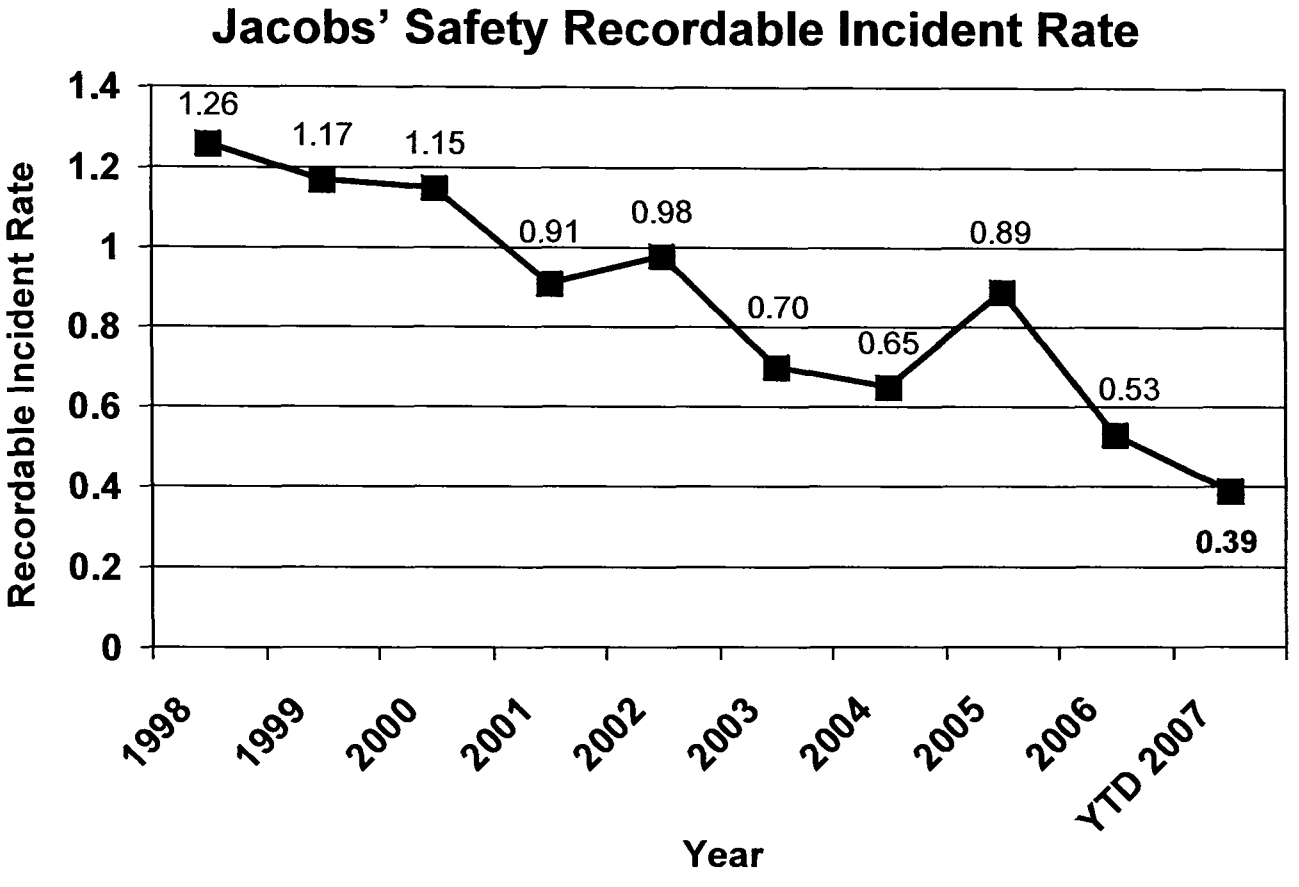
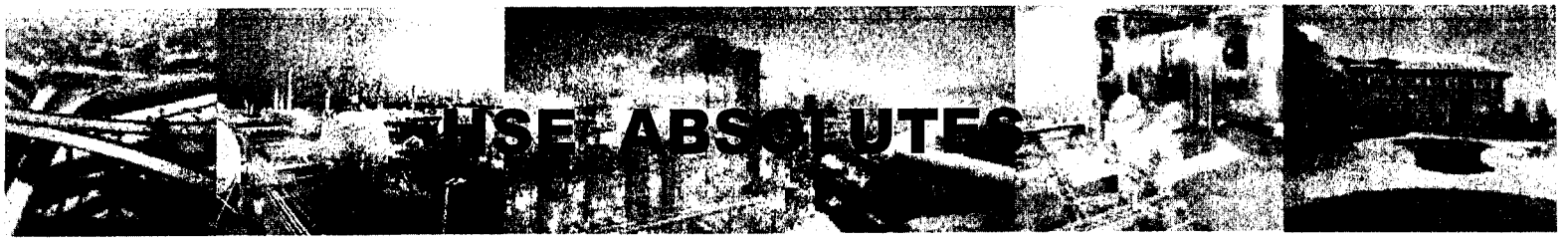
IMC Cost Engineer/Project Planner	1990 – 1992
Davy McKee Corporation	1974 – 1990
Cost Engineer/Project Planner/Estimator	1988 – 1990
Project Planner	1986 – 1988
Procurement Coordinator	1976 – 1986
Supervisor of Expediting	1974 – 1976
Imperial Construction Company Project Manager	1973 – 1974
Holton Construction Company Estimator/Buyer/Contract Administrator/Office Manager	1971 – 1973

Safety / HSE

Our Safety Record



Our OSHA statistics for 2005 reflect the impact of a tragic explosion that occurred at the BP Texas City refinery on March 23, 2005. At the time of the explosion we had approximately 375 employees on site providing engineering and field services. Our employees were working in field offices and in a unit adjacent to the unit where the explosion occurred, doing work unrelated to the unit that exploded. This incident caused 15 fatalities, 11 of whom were Jacobs employees. 127 Jacobs employees had a OSHA Recordable injury, of which 100 involved Days Away from Work. The incident spurred an industry-wide movement to evaluate office locations for all personnel assigned in operating process units and to reexamine industry norms for safe separation distances between office locations and operating units. Jacobs is a leader in both areas.



These fundamental HSE Program elements **must** be followed:

- **DEMONSTRATE** management commitment by providing our people, contractors, clients, and the general public a safe and healthful work environment.
- **IMPLEMENT** the Jacobs HSE process and procedures.
- **SECURE** contract language that clearly defines Jacobs' HSE Roles and Responsibilities and **ENSURE** alignment with Jacobs' HSE objectives.
- **KNOW** the client's HSE requirements and expectations of Jacobs.
- **DEVELOP** a location-specific HSE plan including a **H**azard **A**ssessment **S**afety **A**ction **P**lan.
- **ENSURE** compliance of all subcontractor and consultant HSE Programs and Site-Specific HSE Plans prior to mobilization and during work.
- **ASSIGN** the appropriate number of experienced HSE resources.
- **PLAN** each task by developing a **S**afe **P**lan of **A**ction or equivalent.
- **CONDUCT** HSE orientation for all personnel.
- **PROVIDE** people the instruction and training to safely perform their work.
- **CONDUCT** HSE observations including **S**afety **O**bservation **R**eports or equivalent. Document findings and take corrective action.
- **MONITOR** compliance with company, client, and regulatory standards by conducting HSE audits such as **S**afety **E**valuation **R**eports and Safety Sampling.
- **MEASURE** HSE performance and track continuous improvement.
- **RECOGNIZE** superior HSE performance.
- **MAINTAIN** HSE records.
- **INVESTIGATE** <u>all</u> incidents to prevent recurrence.
- **PROMOTE** HSE both on and "off-the-job".

Strict adherence to these does not guarantee success; ignoring them almost guarantees failure.

The Jacobs HSE Manual is a company-proprietary document. In lieu of enclosing with this proposal the entire, large HSE Manual, we are providing the Manual's Table of Contents. The Table of Contents represents well over a thousand pages of comprehensive policies, procedures, and work instructions on a broad array of health, safety, and environment topics.

Health, Safety, and Environment Manual

Table of Contents

HSE Procedures Approval:
Susan.Kiesling@Jacobs.com

JNet HSE Content Manager:
David.Smith@Jacobs.com

Use ***Ctl F*** feature to search for key words in the Table of Contents.

by date means recently updated or new HSEP.

GLOBAL POLICIES AND PROCEDURES

DOCUMENT NUMBER AND NAME		DATE
	Global Company Policy	
GSOP350	HSE Program	15 Oct 06 <>
	HSE Absolutes	

WORK PROCESS MAPS

DOCUMENT NUMBER AND NAME		DATE
WPM-11	Project Health, Safety, and Environment	3 Sep 01

HEALTH, SAFETY AND ENVIRONMENT PROCEDURES (HSEPs)

DOCUMENT NUMBER AND NAME		DATE
1.0	**HEALTH, SAFETY, AND ENVIRONMENT PROGRAM**	
1.1	Reserved	
1.2	Project HSE Management	30 Jun 05
1.3	Chemical Hazard Communication	1 Oct 07
1.4	Office HSE Management	13 Apr 04
1.4f1	Office HSE Plan – Sample and Guidelines	13 Apr 04
1.4f2	Field Office HSE Checklist	13 Apr 04
1.4f3	HSE Survey Checklist for US Project Offices and Trailers	4 Oct 05
1.5	Health, Safety, and Environment Program Implementation Responsibilities	29 Jul 02
1.6	Field Site Mobilization HSE Requirements	20 Mar 06
1.7	Design Safety	25 Feb 04
1.8	HSE Awards Program	15 Oct 06
2.0	**GENERAL AND ADMINISTRATIVE**	
2.1	Zero Incident Process, Rescinded, Go to GSOP 350	
2.2	Safety Evaluation Reports (SERs)	22 Mar 04
2.2f1	Field SER Form	22 Mar 04
2.2f2	Office SER Form	22 Mar 04
2.3	Audits of Environmental Projects	27 Sep 02
2.4	Regulatory Inspections	4 Mar 04

DOCUMENT NUMBER AND NAME		DATE
2.4f1	Documents Requested	4 Mar 04
2.5	Competent Person Designation	1 Nov 02
2.6	Job Site Notices and Posting Requirements	1 Dec 02
2.7	Work Permits	3 May 02
2.8	Hazard Warnings	1 Jun 97
2.9	Subcontractor HSE	19 Aug 05
	Attachment A, HSE Requirements for US Contractors	17 Aug 07
	Jacobs Subcontractor Injury Performance Standard	19 Aug 05
	Applicant Contractor HSE Rating Worksheet	19 Aug 05
	Attachment A, HSE Requirements for Subcontractors in Canada	30 Mar 07
	Subcontractor Prequalification Evaluation Form For Canadian Operations	19 Aug 05
	Subcontractor Prequalification Evaluation Guidelines for Canadian Operations	19 Aug 05
	Contractor Risk Mitigation Plan For Canadian Operations	19 Aug 05
2.10	California Injury and Illness Prevention Program (IIPP)	1 Jun 97
2.11	Emergency Response Action Plan	15 Nov 03
2.11f1	Model Emergency Response Action Plan	15 Nov 03
2.11f2	Incident Notification	15 Nov 03
2.12	Hazard Assessment and Safety Action Plan (HASAP)	5 Dec 06
2.12f1	Outline and Guide for HASAP Development	5 Dec 06
2.12f2	Occupied Facility Location Review Checklist	5 Dec 06
2.13	Statistical HSE Performance Reporting has been rescinded and merged into HSEP 5.3	6 Jan 05
2.14	Modified Duty	2 Jun 04
2.15	Personnel Demobilization Planning	24 Aug 03
2.16	Safe Plan of Action (SPA)	17 Jul 06
2.16f1	Safe Plan of Action Form	17 Jul 06
2.16f2	SPA Assessment Form	17 Jul 06
2.16f3	Printer-Ready SPA Assessment Pocket Card In PDF Format	17 Jul 06
2.17	Safety Observation Reports (SOR)	17 Feb 04
2.18	Behavioral Safety Observation Report Process	6 May 05
2.22	Hazard Analysis	5 Dec 06
3.0	**TRAINING**	
3.1	*Health & Safety Training*	6 Dec 06
3.1f1	HSE Training Guidelines by Job Function Matrix	6 Dec 06
3.2	Health & Safety Training – Hazardous Waste Operations	1 Jun 97

DOCUMENT NUMBER AND NAME		DATE
4.0	**MEDICAL**	
4.1	Medical Monitoring Program For Environmental Project Work	28 Aug 01
4.2	Medical Monitoring & Training Tracking System	28 Aug 01
4.3	Reserved	
4.4	First Aid Program	10 Nov 06
5.0	**ACCIDENT AND INCIDENT REPORTING AND RECORD KEEPING**	
5.1	Accidents and Incidents	3 Jan 06
5.2	Vehicle Accidents	3 Jan 06
5.3	HSE Performance Metrics	19 Feb 07
6.0	**POTENTIALLY HAZARDOUS WORKPLACES**	
6.1	Abrasive Blasting Areas	17 Sep 03
6.2	Carpenter Shops	7 Oct 03
6.3	Insulation Shops	29 Sep 03
6.4	Mechanic Shops	21 Feb 05
6.5	Paint Yards	31 Mar 05
6.6	Pipe Shops and Pipe Fabrication	12 Jan 07
6.6f1	Jack Stand Inspection Form	12 Jan 07
6.6f2	Jack Stand Inspection Points	12 Jan 07
6.7	Shop and Storage Areas	29 Jul 05
6.8	Structural Iron Shops	29 Jul 05
6.9	Warehouse Safety	29 Jul 05
6.10	Rescinded	
7.0	**POTENTIALLY HAZARDOUS ENVIRONMENTS**	
7.1	Reserved	
7.2	Confined Space Entry	6 Apr 06
7.2f1	Confined Space Entry Assessment And Permit	10 Mar 06
7.3	Hazardous Materials Sites and Hazardous Waste Sites	9 Aug 01
7.3.1	Site Health, Safety, and Environment Plans	9 Aug 01
7.3.2	Site Control	13 Aug 01
7.3.3	Utility Clearance	21 Aug 06
7.3.4	Project Initiation	20 Aug 01
7.3.5	Materials Handling, Related to Hazardous Waste Activities	13 Aug 01
7.3.6	Drum Handling	14 Aug 01
7.3.7	Emergency Planning and Response	14 Aug 01
7.4	Working Safely Around Wild Animals	28 Aug 01
7.5	Locating and Removal of Screw Pickets	23 Dec 02
7.6	Working in Environments with Endless Belt Manlifts	7 Mar 07
8.0	**POTENTIALLY HAZARDOUS OPERATIONS AND ACTIVITIES**	
8.1	Concrete Work	14 Aug 01
8.2	Seal Plugs and Plumber's Plugs	14 Aug 01
8.3	Excavating Equipment Use and Operator Qualification	21 Sep 07
8.4	Excavations	29 Jul 05
8.5	Line and Equipment Opening	29 Jul 05
8.6	Material Handling and Storage	15 Sep 06
8.7	Underground Storage Tank Removal	29 Jul 05

DOCUMENT NUMBER AND NAME		DATE
8.8	Oxy-Fuel Cutting and Gas Welding and Electric Arc Welding	29 Jul 05
8.9	Drilling In VOC Contaminated Soil	29 Jul 05
8.10	Drill and Drill Rig Safety	29 Jul 05
8.11	Hot Taps and Welding on In-Service Equipment	6 Jan 05
8.12	Purging Natural Gas Fueled Equipment and Pipes	20 Apr 05
9.0	**POTENTIALLY HAZARDOUS SUBSTANCES**	
9.1	Asbestos Exposure Protection	30 Mar 04
9.2	Asbestos Avoidance	30 Mar 04
9.3	Hexavalent Chromium Exposure Protection - US Operations	23 May 06
9.3.1	Project-Specific Hexavalent Chromium Exposure Protection Program	23 May 06
9.4	Lead Exposure Protection	22 Feb 07
9.5	Unexploded Ordnance Clearance	18 Sept 01
9.6	Mold Prevention and Remediation	2 June 04
9.7	Hydrogen Sulfide	18 May 07
10.0	**RADIATION**	
10.1	Radiation Protection Program	26 Sept 01
10.2	Radiographic Work	13 Sept 01
10.3	Nuclear Density Gauges	4 May 04
11.0	**HAZARD CONTROL PROCEDURES**	
11.1	Biological Hazard Control	17 Sept 01
11.2	Bloodborne Pathogen Exposure Control	1 Feb 07
11.3	Chemical Warfare and Incendiary Agents	18 Sept 01
11.4	Cold Stress Control	18 Sept 01
11.5	Heat Stress Control	18 Sept 01
11.6	Occupational Noise	18 Sept 01
11.7	Spill Containment	29 Jul 05
11.8	Ergonomics	6 Oct 04
11.9	Decontamination	19 Sept 01
11.9.1	Level A Decontamination	24 Sept 01
11.9.2	Level B Decontamination	24 Sept 01
11.9.3	Level C Decontamination	24 Sept 01
11.9.4	Level D Decontamination	24 Sept 01
12.0	**INDUSTRIAL HYGIENE MONITORING AND SURVEILLANCE**	
12.1	Health Hazard Evaluation	1 Oct 07
12.2	Personal Air Monitoring	24 Mar 03
13.0	**PERSONAL PROTECTION PROGRAM**	
13.1	Personal Protective Equipment	29 Jul 01
13.2	PPE Program for Environmental Activities	28 Aug 01
13.3	Head Protection	12 Jan 07
13.4	Hand Protection	13 Sept 01
13.5	Foot Protection	29 Jun 01
13.6	Eye and Face Protection	10 Aug 01
13.7	Work Attire and Clothing	26 Aug 01
13.8	Fall Prevention and Protection	28 May 03

DOCUMENT NUMBER AND NAME		DATE
	Questions and Interpretations	6 Jun 03
13.9	Respiratory Protection Program	8 May 03
13.9f1	Site-Specific Respiratory Protection Program Model Form	8 May 03
14.0	**EMERGENCY & CONTINGENCY PLANNING**	
14.1	Emergency Evacuation	28 Aug 01
14.2	Earthquake	28 Jul 01
14.3	Hurricanes and Typhoons	29 Jul 01
14.4	Remote Site Emergency Preparedness	29 Jul 01
15.0	**PHYSICAL HAZARD PREVENTION PROCEDURES**	
15.1	Lock-out/Tag-out	22 Jul 02
15.2	Scaffolding	12 Apr 04
15.3	Work Over or Adjacent to Water	22 Oct 03
15.4	Offshore Work Locations	Under Construction
16.0	**MAINTENANCE AND STORAGE AREAS**	
16.1	Compressed Gas Cylinder Storage	18 Jul 01
16.2	Flammable and Combustible Liquids Storage	29 Jul 05
16.3	Fuel Storage	29 Jul 05
16.4	Housekeeping and Material Handling	29 Jul 05
16.5	Waste and Trash Receptacles	29 Jul 05
17.0	**HEAVY EQUIPMENT**	
17.1	Mobile Cranes	21 Sep 07
17.2	Mobile Crane Operator Certification	22 Jul 02
	Questions and Interpretations	15 Sep 03
17.3	Crane Suspended Personnel Baskets	4 Aug 05
17.4	Forklifts	29 Jul 05
17.5	Forklift Operator Qualifications	25 Jul 01
17.6	Rigging	5 May 04
17.7	Critical Lifts	7 Dec 05
17.8	Steel Erection and Dismantling	22 Mar 02
17.9	Aerial and Scissor Lift Use	31 Aug 06
17.10	Forklift Mounted Work Platforms	14 Mar 05
17.11	Overhead Cranes	3 Aug 04
18.0	**TOOLS AND SMALL EQUIPMENT**	
18.1	Chain Falls and Come-a-longs	30 Jul 01
18.2	Electrical Tools	22 Jul 02
18.3	Ladders and Stairways	6 May 03
18.4	Small Tools and Equipment	14 Aug 01
18.5	Pedestal, Bench, and Portable Grinders	30 Sep 04
18.6	Pneumatic Tools	28 Aug 01
18.7	Powder Activated Tools	28 Aug 01
19.0	**ELECTRICAL SAFETY**	
19.1	Electrical Safety	25 Sep 02
19.2	Assured Grounding (Electrical Inspections)	29 Jul 02
19.3	Qualified Electrician Program	15 Aug 01

DOCUMENT NUMBER AND NAME		DATE
19.4	Energized and Potentially Energized Electrical Equipment	25 May 07
20.0	**FIRE PREVENTION**	
20.1	Fire Prevention	15 Aug 01
20.2	General Fire Protection	16 Aug 01
20.3	Fire Extinguishers	28 Aug 01
21.0	**TRANSPORTATION**	
21.1	Transportation of Materials and Personnel	29 Jul 05
21.2	Motor Vehicle Safety	4 Mar 04
21.2f1	Blank Rental Vehicle SPA Form	4 Mar 04
21.2f2	Sample Completed Rental Vehicle SPA Form	4 Mar 04
21.2f3	Motor Vehicle SPA Pocket Card	11 May 07
21.3	Travel to Remote and Difficult Locations	16 Aug 01
21.4	Travel Safety	21 Jan 05
22.0	**ENVIRONMENTAL**	

QA / QC

The Jacobs Global Quality Manual is a company-proprietary document. In lieu of enclosing with this proposal the entire Global Quality Manual, we are providing the Manual's Table of Contents.

JACOBS

Global Quality Manual		Document No: N/A	Page:
		Supersedes: Rev 0	Revision: 1 Issue Date: 24-May-04
Issuing Department: Corporate Quality	Functional Manager: Margaret Bell@Jacobs.com	Previous Rev. & Issue Date: Rev 0, 15-Nov-03	Effective Date: **24-May-04**

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1.2 OUR GLOBAL MANAGEMENT SYSTEM 2

2.0 SCOPE OF APPLICATION 2

3.0 DEFINITIONS 2

4.0 QUALITY AND HEALTH, SAFETY, AND ENVIRONMENT POLICY 2

5.0 GLOBAL QUALITY SYSTEM DOCUMENTS 3
5.1 GLOBAL QUALITY MANUAL, GLOBAL STANDARD OPERATING PROCEDURES, BASELINE WORK PROCESS MAP, JACOBS VALUE ENHANCING PRACTICES, AND BUSINESS IMPROVEMENT PRACTICES 3
5.2 REGIONAL/LINE OF BUSINESS QUALITY SYSTEMS 4
5.3 CONTROL OF QUALITY SYSTEMS DOCUMENTS 4
5.4 CONTROL OF QUALITY RECORDS 4

6.0 MANAGEMENT RESPONSIBILITY 4
6.1 MANAGEMENT COMMITMENT 4
6.2 CUSTOMER FOCUS – MEETING CUSTOMER EXPECTATIONS 4
6.3 MANAGEMENT PLANNING 5
6.4 MANAGEMENT REVIEWS 5
6.5 RESPONSIBILITY, AUTHORITY, AND COMMUNICATION 5

7.0 RESOURCE MANAGEMENT 6
7.1 PROVISION OF RESOURCES 6
7.2 EMPLOYEE RECOGNITION 7
7.3 WORK ENVIRONMENT AND INFRASTRUCTURE 7

8.0 PROJECT DELIVERY 7
8.1 CUSTOMER FOCUS 7
8.2 PROJECT PLANNING 7
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8.4 GLOBAL STANDARD OPERATING PROCEDURES 8
8.5 LINE OF BUSINESS AND REGIONAL STANDARD OPERATING PROCEDURES 8
8.6 BEST PRACTICES 8

9.0 PROJECT PERFORMANCE MEASUREMENT, ANALYSIS, AND IMPROVEMENT 8
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File Name: Global Quality Manual.doc

General Information

GENERAL INFORMATION

In the event that your Proposal is accepted and a Contract is awarded to the firm whose full legal company name appears herein below, Mr./~~Mrs.~~ James T. Stewart, whose title is Group Vice President, Eastern Region, will be executing the Contract on behalf of the firm. Should this person's title not indicate that he/she is a corporate officer (president, vice president, or corporate secretary), an affidavit signed by a corporate officer shall be provided along with the bid, stating that the person whose name appears above is duly authorized to execute contracts on behalf of the firm.

The Contractor is: (select appropriate line and complete information)

An Individual: _____

A Corporation of the State of: Delaware

A Partnership consisting of: _____

A Joint Venture comprised of: _____

Full Legal Company Name Jacobs Engineering Group Inc.

Business Address 1041 East Butler Road

Greenville, SC 29607

Mailing Address (if different) P. O. Box 5456

Greenville, SC 29606-5456

Contact Name Steve Hazle

Contact Phone 864-676-6179

Contact E-Mail steve.hazle@jacobs.com

Company Website www.Jacobs.com

Federal Tax ID Number 95-4081636

Contractor's License Number (if applicable) _____ State of Issuance _____

In accordance with the Federal Acquisition Regulation section 52.219, please check all that apply to your company. Please provide supporting documentation or certification to confirm the status for any categories checked under Small/Diverse Vendors.

[ ] Certified small business*
[ ] Veteran-owned business*
[ ] Service-disabled veteran-owned business*
[ ] Not a Small Business
[ ] HUBZone, 8(a) or disadvantaged business*
[ ] Minority-owned business * *
[ ] Women-owned small business * *

* As defined by the Small Business Administration (SBA): www.sba.gov
* * Certified by Progress Energy and as defined by SBA.

Register online at www.progress-energy.com/supplierdiversity

BY: _____

NAME (printed): Steve Hazle

TITLE: Manager, Business Development

DATE: October 5, 2007

14/08/07
3:06PM

MPR ASSOCIATES INC. PRICED
ENGINEERS

September 28, 2007

Ms. Deborah Hanna
Progress Energy Florida, Inc.
15760 W. Powerline Street (SA2C)
Crystal River, FL 34428-6708

Subject: Proposal Response to Request No. DH07-003, "Crystal River Discharge Canal Cooling Study"

Dear Ms. Hanna:

MPR is pleased to submit one priced and one unpriced proposal in response to the subject request issued by Progress Energy Florida on August 27, 2007. Also enclosed are two copies of our Quality Assurance Manual as requested in the bid requirements.

We believe that we are uniquely qualified to successfully perform this study for Progress Energy as demonstrated by our 40+ years of providing innovative solutions to some of the most challenging problems that our power industry clients have faced. MPR is recognized as a specialty engineering firm that offers unique solutions to challenging problems. We approach each new problem from a "first principles" perspective and use an open, collaborative peer review process to ensure that possible solutions to a given problem are identified and thoroughly vetted. We encourage out-of-the box thinking while sharing the "real-world" perspective of a power plant owner and operator.

MPR has performed extensive work at the Crystal River Energy Complex over the past 25+ years for both the nuclear and fossil units. As part of this work, MPR participated in the Crystal River Extended Power Uprate (EPU) Design Review meeting held in Charlotte this past May. Our participation in that meeting provided us with a good understanding of the challenges facing the EPU project and the criticality of this discharge canal cooling study to the success of the overall project. We are excited at the opportunity to continue to support Progress Energy on this important project. Please contact me at (703) 519-0200 if you have any questions related to this proposal or our company in general.

Sincerely,

Kevin Myers

Kevin Myers, P.E.

Enclosures

320 KING STREET ALEXANDRIA, VA 22314-3230 703-519-0200 FAX: 703-519-0224 http://www.mpr.com

10/08/07
3:00pm

WorleyParsons

resources & energy

2675 Morgantown Road
Reading, Pennsylvania 19607
USA
Telephone: 610-855-2000
Facsimile: 610-855-2001
www.worleyparsons.com

October 3, 2007

Deborah Hanna
Progress Energy Florida, Inc.
15760 W. Powerline Street
Crystal River, Florida 34428-6708

RE: CRYSTAL RIVER DISCHARGE CANAL COOLING STUDY
WORLEYPARSONS PROPOSAL NO. 0907R2022

Dear Ms. Hanna:

WorleyParsons is pleased to submit one priced copy and one unpriced copy of our proposal for the Crystal River Discharge Canal Cooling Study. This proposal responds directly to your request for proposal (RFP No. DH07-003). With over 100 years of tradition in our Power-based heritage companies of Chas. T. Main, Gilbert/Commonwealth, Parsons E&C, and now WorleyParsons, we bring this depth of experience and expertise to your project and will continue to build on the historical success of current and past projects.

WorleyParsons is one of the world's largest engineering and project delivery firms, servicing the global resource, energy, and infrastructure markets. With over 23,800 personnel in 84 offices in 32 countries around the globe, WorleyParsons has the technical expertise, project delivery systems, and resource depth to provide a comprehensive range of solutions to our clients. When experience counts, WorleyParsons has the track record and expertise that customers trust. WorleyParsons focuses on safe and successful project delivery in the following industry sectors: Power, Hydrocarbons (upstream and downstream), Minerals and Metals, and Infrastructure.

WorleyParsons provides engineering, procurement, construction management, program management, consultancy, and operations and maintenance services to clients in these sectors. Our solutions are customized to address regional, client, and project-specific requirements.

The WorleyParsons team brings distinct advantages over the competition in our commitment to safety, team performance, long-term client relations, focus on project delivery, corporate experience, depth of personnel experience, and location. WorleyParsons is committed to successful project delivery for both large and small projects. We have managed projects as large as $3 billion, as well as engineering services on a per task/man-hour basis. We value both extremes of our business portfolio for balance and customer diversification.

WorleyParsons

resources & energy

We look forward to your review of the information included in this submittal. If you have any questions, please contact our proposed project manager, David Trudel, at 610-855-2376. We are eager to participate and support the Progress Energy Florida on your planned study. Thank you again for the opportunity to submit our proposal.

Very truly yours,
WorleyParsons Group, Inc.

Steven B. Davis
Vice President

PEF-NCR-00394

WorleyParsons
resources & energy

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Section 2 – Project Team	2
Section 3 – Cooling Tower and Water Discharge Systems Experience	3
Section 4 – Pricing	4
Section 5 – Clarifications and Exceptions	5

Section 4 Pricing

Item	Scope	Estimated Cost
Phase 1	Alternates Study	
	➢ Labor	REDACTED
	➢ ODC	
	➢ Travel	
	➢ Fee	
	➢ **Total**	
Phase 1 Option	Use of Unit 4 & 5 Tower	
	➢ Labor	
	➢ ODC	
	➢ Travel	
	➢ Fee	
	➢ **Total**	
Phase 1	Conceptual Design	
	➢ Labor	
	➢ ODC	
	➢ Travel	
	➢ Fee	
	➢ **Total**	

10/08/07
3:02 PM

Priced Version

PROPOSAL FOR
CRYSTAL RIVER DISCHARGE CANAL COOLING STUDY

Request for Proposal (RFP) – DH07-003

Deborah Hanna
Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Powerline Street (SA2C)
Crystal River, FL 34428-6708

Submitted by:

Enercon Services, Inc.
500 TownPark Lane
Kennesaw, GA 30144
770-919-1930

October 5th, 2007

ENERCON Proposal Number: PECR-07-3011

Contractor's License Number (if applicable) _____ State of Issuance _____

In accordance with the Federal Acquisition Regulation section 52.219, please check all that apply to your company. Please provide supporting documentation or certification to confirm the status for any categories checked under Small/Diverse Vendors.

[ ] Certified small business* [ ] HUBZone, 8(a) or disadvantaged business*
[ ] Veteran-owned business* [ ] Minority-owned business * *
[ ] Service-disabled veteran-owned business* [ ] Women-owned small business * *
[X] Not a Small Business

* As defined by the Small Business Administration (SBA): www.sba.gov
* * Certified by Progress Energy and as defined by SBA.

Register online at www.progress-energy.com/supplierdiversity

BY: _____

NAME (printed): JIM GANNON

TITLE: CLIENT SERVICES MANAGER

DATE: OCTOBER 4TH, 2007

6.0 Commercial Proposal

6.1 *Cost and Commercial Terms*

ENERCON will perform the work described as specified in this proposal on a time and material basis not to exceed the following amounts without prior written authorization:

PHASE I Alternatives Analysis - [redacted]
PHASE II Conceptual Design - REDACTED

All work will be performed in accordance with the time and materials rates, terms and conditions of our existing Master Services Agreement with Progress Energy. This proposal is valid for 30 days.

6.2 *Resource Allocation*

The following provides anticipated resource requirements for each phase of the project.

Labor Category	Phase I Hours	Phase II Hours
Project Manager	REDACTED	REDACTED
Principle Civil / Structural Engineer		
Senior Civil / Structural Engineer		
Civil Structural Engineer I		
Principle Electrical Engineer		
Senior Electrical Engineer		
Electrical Engineer		
Electrical Engineer I		
Principle Mechanical Engineer		
Senior Mechanical Engineer		
Mechanical Engineer I		
Designer		
Drafter		
Administrative Assistant		
Scheduling Specialist		
TOTAL RESOURCE ALLOCATION		

6.3 *Assumptions and Clarifications*

The following assumptions were used in developing the stated price:

1. Five copies of the draft report will be provided to Progress Energy for review and comment.
2. Progress Energy will provide one (1) consolidated set of comments to the draft report within 5 working days of submittal.
3. As this is a study, not providing engineering output or effecting changes to plant configuration, this project will not fall under the requirements of the Enercon's Quality Assurance program.
4. To expedite completion of this project, Progress Energy shall provide point-of-contacts within the Crystal River 3 site organizations to provide input and facilitate document retrieval.
5. No allowance is made for the services of a subcontractor such as SPX Cooling Technologies (formerly Marley Cooling Technologies). The need for these services is not currently apparent for this work scope, but would require additional funding if desired or required.
6. Enercon work scope is limited to that as described in this proposal.

6.4 *Exceptions*

1. ENERCON has provided an alternative schedule to that requested in the RFP. Milestone dates are provided in Section 4.0 Schedule.
2. ENERCON has provided an alternative approach to the Alternatives Analysis Process that involves performing a "Fatal Flaw" analysis intended to identify options that have particular issues which may significantly limit reasonable technical, operational, or financial feasibility. In turn, the analysis performed for each option may not include the entire suite of considerations outlined in the RFP.

Cope, Sandra C

From: Massey, Todd [Todd.Massey@jacobs.com]

Sent: Friday, October 05, 2007 4:46 PM

To: Hanna, Deborah A

Cc: Hazle, Steve; Plata, Ken; Hickman, Mark

Subject: 0710-LAK-P0164 - Jacobs Proposal - Progress Energy Crystal River Discharge Canal Cooling Study

Deborah,

I am happy to submit our proposal for the Crystal River Discharge Canal Cooling Study. Please contact Ken Plata at 863-669-1263 or Steve Hazle at 864-414-5590 if you have any questions.

Kindest regards,

Todd A. Massey

Inside Sales
PH - 864-676-6463
FX - 864-676-5096
Jacobs Engineering
1041 East Butler Road
Greenville, SC 29607

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JACOBS

3149 Winter Lake Road
Lakeland, Florida 33803, USA
+1.863.669.2206, Fax: + 1.863.669.2220

October 5, 2007

Ms. Deborah Hanna
Progress Energy Florida
8202 West Venable Street
Crystal River, Florida 34429

Email: Deborah.Hanna@pgnmail.com

Subject: Crystal River Discharge Canal Cooling Study
Jacobs Proposal No. 0710-LAK-P0164

Dear Deborah,

Jacobs is pleased to offer our proposal to provide conceptual and preliminary design engineering services to study methods for cooling your Crystal River Discharge Canal.

We offer a team with valuable years of experience in delivering projects with aggressive schedules. We have selected key team members with appropriate experience on similar projects to lead the cooling equipment and environmental evaluations. We have included résumés for each of the key team members for your review in the Appendix. Our organization chart is provided in the Organization and Project Team section.

You have requested that we identify other alternatives for consideration. During the study we will evaluate several alternatives to provide the required cooling. One option that you have not listed in your RFQ will be an ammonia based refrigeration system. We believe this type of refrigeration system may provide some synergy with your current plans for installing a new Urea Plant at your Crystal River facility. We are currently working with you at both Bartow and Crystal River. For this study, we will utilize team members that have worked with Progress Energy in the past and are familiar with your preferred methods and practices.

In our proposal, we have addressed concerns you listed in your RFQ, detailed our approach to the work, and provided a project schedule which we believe is obtainable. We have also completed the General Information section from your RFQ and included it with our proposal.

Jacobs currently has a Work Authorization Program in place with Progress Energy. All terms and conditions will be as agreed upon in Master Services Agreement, Contract #2767.

If there are any questions, please feel free to call me at 864-414-5590 or Ken Plata at 863-669-2163. We look forward to working with you.

Sincerely yours,

Steve Hazle
Manager, Business Development

Ken Plata
Project Manager

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PEF-NCR-00309

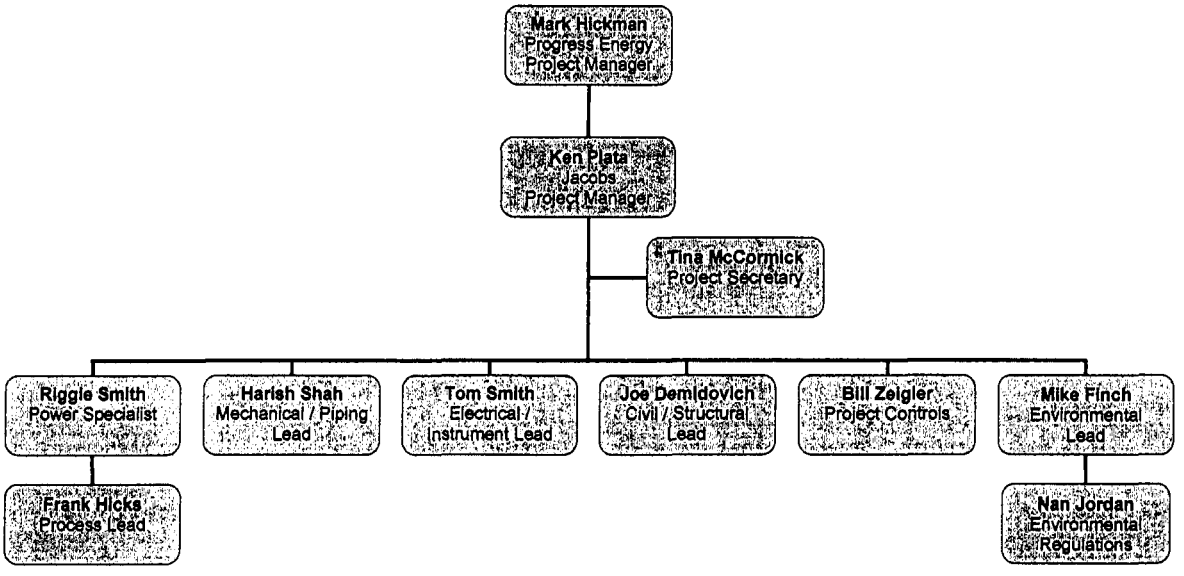
Section 1
Organization & Project Team

In order to develop a comprehensive and efficient engineering design and provide the necessary project execution support, the work will be conducted as a coordinated effort by a group of experienced managers, engineers, and designers.

1.1 Project Organization

Our project team is led by Ken Plata, who is responsible for managing the progress of the progress and reporting to your Project Manager, Mark Hickman. Ken is familiar not only with working with Progress Energy, but also with the Crystal River site. Ken is the single point of contact for Jacobs and maintains regular communication with Mark Hickman through the course of the work.

Riggie Smith is a Senior Power Engineer, has conducted studies to evaluate and recommend cooling systems alternatives at other power plants. Mike Finch provides expert services in the areas of environmental planning and design, hydrologic and hydraulic analysis, Surface Water and Flood Protection Management, plans review, code enforcement, and permitting. Riggie, Mike and the other discipline leads report to Ken on the progress of design and to communicate any issues they may incur.



1.2 Key Team Members

The **Key Personnel** nominated for the project average over 30 years of engineering experience. They were selected based on their knowledge of Progress Energy and the technical requirements to successfully complete this project. We have identified the key personnel below with a short description of their capabilities.

Ken Plata
Project Manager

Mr. Plata has over 30 years of experience in the engineering, procurement and construction fields primarily serving the fertilizer, phosphoric acid, power, chemical, pharmaceutical and pulp & paper industries. Detailed experience has encompassed areas of environmental study and compliance, project due diligence and finance, pro-forma evaluations, process calculations and design, construction and project management for a wide range of capital cost projects. Project Management has ranged from conceptual studies and estimates, to approving, managing and coordinating on-site construction projects. Mr. Plata is a Senior Project Manager in Jacobs' Lakeland, Florida Operations.

Mike Finch
Environmental Specialist

Mike has more than 25 years experience with engineering planning and design, as well as project and construction management. Mike is currently working on the permitting, drainage and wetland mitigation for the Progress Energy Clean Air Project road development, and assisted on the past review of the MTSA project. Mike provides expert services in the areas of environmental planning and design, hydrologic and hydraulic analysis, surface water and flood protection management, plans review, code enforcement, and permitting. Recent previous assignments included Surface Water Management / CRS Coordinator for Polk County; Sawgrass Expressway Design Build Drainage Engineer of Record, and Marco Island Bridge Project FDOT District One, Drainage Engineer of Record. In all projects he provided drainage design plans and permitting for both roadway widening and bridge reconstruction.

Riggie Smith
Senior Power Engineer

Riggie has a Mechanical Engineering Degree from Clemson University and 35 years of experience as a power engineer. He has led a study and estimate effort to evaluate alternatives to mitigate existing complexities for a power plant in South Carolina, and a study to convert a once-through cooling system into a closed cycle cooling system for the same client. He has significant experience in new installations and rebuilds of fossil fuel boilers for industry and utility companies. He is very well versed in emission control modifications, particularly precipitators.

Joe Demidovich
Civil / Structural Lead

Mr. Demidovich has over 34 years of experience, including 18 with Jacobs as a Senior Civil / Structural Engineer. His structural steel, reinforced concrete, and civil engineering design / supervisory experience has been utilized in the design and construction of industrial plants serving the chemical, fertilizer, food, mining, petrochemical, plastics, synthetic fuels, metal, steel, paper, power, wood products industries and gypsum wall board industries.

Frank Hicks
Process Lead

Mr. Hicks has worked in the phosphate industry for over 30 years in both plant operations and as an industry consultant. He is Jacobs Manager of Minerals, Beneficiation Projects responsible for review and approval of minerals beneficiation projects. His duties include development of internal programs to develop and apply new minerals beneficiation technology, improved plant performance, plant testing, process modifications, development of process design and computer applications for process analysis, and evaluation of process alternatives, feasibility studies, and process selection. Mr. Hicks is also responsible for the definition and mitigation of environmental impacts of mining and waste disposal.

Harish Shah
Mechanical / Piping Lead

Mr. Shah has over 34 years experience in mechanical engineering and all areas of technical job management, plant design, HVAC, plumbing, project management, facilities engineering, maintenance management, client liaison and project coordination. Experience also includes supervising

engineering and design personnel, coordinating work with other disciplines, writing specifications, engineering calculations, manhour estimates, schedules and construction cost estimates.

Tom Smith
Electrical / Instrumentation Lead

Mr. Smith has over 18 years of project management, design and construction management / start-up experience on chemical, pharmaceutical, pulp and paper, power generation and institutional projects. He has been a lead engineer on a variety of projects ranging from technical studies to full service EPC projects. His technical strengths are in power distribution, motor control, lighting, DCS/PLC interface, equipment specifications, calculations and studies. He is responsible for technical quality within the E&I department.

Bill Zeigler
Project Controls Manager

Mr. Zeigler has over 36 years of experience, including 14 years with Jacobs, serving as the Manager of Project Controls. He has held positions in planning and scheduling, cost control, estimating, procurement, field supervision, and various construction trades, providing him with a unique depth of experience to draw from in establishing and maintaining project controls systems. Mr. Zeigler's experience includes interactive planning, development of detailed schedules, application and leveling of resources, establishment of tracking systems for determining physical progress, and design and implementation of reporting systems.

Section 2
Project Approach

The following section describes the execution plan for the project.

2.1 Overview / Summary

Our technical proposal is in response to your request for the Crystal River Discharge Canal Cooling Study.

We have assembled a Project Team comprised of members with expertise in each area of performance including design knowledge with direct experience in power plant cooling towers, detailed cost estimating of industrial equipment, and experience in handling environmental wetland mitigation concerns.

We propose to manage our core team from the Lakeland, Florida office, drawing upon in-depth technical support as required from Jacobs' Tampa, Philadelphia and Greenville offices.

Our Project Team has experience in working on complex, fast track projects. We believe that the key to coordinating and implementing a project of this magnitude with tight time constraints lies with both experienced project management and open lines of communication between team members and your assigned Project Managers and staff.

We utilize several tools, including teleconferences, WebEx and JPI to facilitate the regular interaction and reviews among the various Jacobs offices. WebEx is an interactive internet tool, utilized in teleconferences, that allows team members to simultaneously review the same document, share comments and discuss issues related to the design. JPI is a secure project document sharing database that maintains project documents in a file structure that allows documents to be shared instantly between offices, regardless of location.

Upon completing the Phase 1 Study, the lead engineers begin developing the Phase 2 Conceptual Design and Estimate Package. Our technical power / process specialists oversee the conceptual design as it develops, and confirm with the discipline leads that the design follows the best industry practices and standards.

2.2 Project Initiation and Work Plan / Staffing

Upon notice to proceed, we schedule a Design Initiation Meeting (kick-off meeting) between team members from both companies. This meeting is held at the Crystal River plant site. The purpose is to discuss and confirm the following:

- Study objectives, schedule and program
- General plant plot plan layouts
- Codes and standards to be used in the engineering design
- Time required for receipt of information
- Project milestone schedule
- Project coordination procedures
- Action items that lead to additional task details
- A list of decisions relating to project approach
- Other items considered necessary by all parties including agreed actions by each party for follow-up items

The meeting concludes with an Interactive Planning Session (IPS) which forms the groundwork to develop the detailed project schedule.

2.2.1 Phase 1 – Study

The Phase 1 Study identifies and evaluates alternatives, as indicated in the Progress Energy work scope document, for reducing the discharge canal water temperature in accordance with:

- Planned thermal increase associated with CR3's EPU
- Minimizing the impact and de-rating to CR1 and CR2
- Complying with all existing and proposed environmental permits

The primary objective is to review the Scope of Work alternatives and other possible solutions, compare these alternatives and recommend the most cost effective and technically feasible solution within reason.

To facilitate this objective we plan on utilizing our power engineering consultants that have performed similar study efforts to identify issues and concerns with each alternative. Our work is broken into task assignments with the power / process group leading the initial review at the plant site. This should occur during Weeks 1 through 3.

Our disciple leads and environmental group begin their review by Week 3 and continue through Week 6. As the alternative matrix is developed we begin the economic cost estimate and schedule analysis (Weeks 7 through 8). During the final week, we prepare the Alternatives Summary Report. During this study effort we work closely with the PEF Project Manager to keep him/her informed of the development of each step. We estimate that Phase 1 requires 9 weeks to complete.

Since our Lakeland Office is only a 2 hour drive from the Crystal River complex, we envision that the majority of the work effort is competed in Lakeland. However initial data gathering and site evaluations occur during the first 2 weeks at the plant site.

We expect Phase 1 includes the following team members:

- Project Manager / Project Engineer
- Power Specialist
- Process Lead
- Mechanical / Piping Lead
- Civil / Structural Lead
- Electrical / Controls Lead
- Cost Controls and Scheduling
- Environmental Specialist
- Estimating
- Project support

2.2.2 Phase 2 – Conceptual Design and Estimate

Phase 2 Conceptual Design begins after you review and approve of the Alternatives Summary Report. The engineering completed during the Conceptual Design contains sufficient detail of the selected alternative to allow Progress Energy to solicit bids for the detail design package.

The Conceptual Design Package is in accordance with the Progress Energy work scope document, and is finalized as a Conceptual Design Report package. The work is preformed at the Jacobs Lakeland office. We estimate that Phase 2 requires 12 weeks to complete.

We expect Phase 2 includes the following team members:

- Project Manager / Project Engineer
- Power Specialist
- Process Lead
- Mechanical / Piping Lead, engineers, designers
- Civil / Structural Lead, engineers, designers
- Electrical / Controls Lead, engineers, designers
- Cost controls
- Scheduling and Planning
- Environmental Specialist and support
- Estimating
- Project support

2.3 Project Schedule and Reporting

The Scheduling System provides management with the "bridge" to achieve project objectives within the constraints of time, budgets, manpower, materials and technical specifications. It provides a schedule that defines the time in which tasks must be performed, the manpower necessary to perform the tasks and the materials and specifications required for the work to progress within the schedule.

The objectives of the Scheduling System are to:

- Assure that each performing discipline plans and schedules the work for which it is responsible
- Clearly identify time relationship, resource constraints and interfaces of the various project activities, milestones and contractual objectives
- Provide the means by which to integrate the scheduling process with the scope of work definition and budgeting processes
- Monitor and control performance with respect to scheduled vs. actual performance, impact of delays and cost alternatives
- Effectively integrate the flow of information
- Develop and control a schedule base which facilitates the assessment of work progress in terms of project milestones, work completed, percent complete of in-progress activities and viability to future project activities.

The Scheduling System provides a comprehensive time and resource analysis system based on the critical path method (CPM) technique. We utilize two leading software systems, Microsoft Project and Primavera Finest Hour. The choice of software is based on your preference and project needs.

Both systems offer a great variety of standard planning and scheduling reports. The scheduling system is fully integratable with the standard code-of-accounts, Cost System and Performance Measurement System and is able to provide Cash Flow, Quantity Flow, Manpower Requirements, Earned Value and a number of other management information tools.

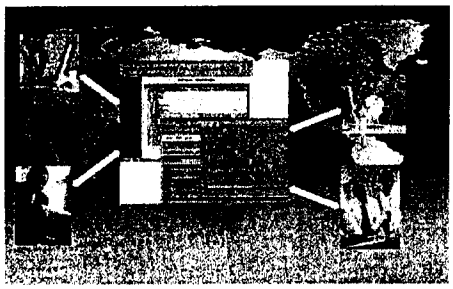
The Project Master Schedule reflects the project plan showing all significant schedule dates and milestones, and establishes the overall schedule baseline. It is the control schedule for the overall project and provides a communication vehicle to our management and to you.

The Project Master Schedule establishes the framework for developing the discipline and logic network schedules. It is

intended to present a complete snapshot of the overall project schedule, without excessive detail.

The system assists the Project Team with developing a valid performance plan, monitoring performance against expected milestones and producing reports that permit the project team to redirect activities in the best interest of the project. To achieve this aggressive schedule it is critical that Jacobs and Progress Energy collaborate very closely. Therefore, we recommend beginning the project with an Interactive Planning Session (IPS) to discuss the project goals and the various interfaces among the parties. The IPS is held as part of the kick-off meeting.

2.4 Jacobs Project Information System – JPI



Phase 1 Study and Phase 2 Conceptual Design package is led by the Jacobs' Lakeland, Florida office, with assistance from our Tampa, Greenville and Philadelphia offices. Jacobs Project Information System (JPI) is used to store all project data and documents in a secure database. With JPI, you are also able to view documents for comment and approval.

All drawings and documents for this project are stored on a server in Lakeland and can be accessed with different viewing or editing privileges by different users. For example a drawing may be created and checked in Lakeland, and comments added by Greenville and Raleigh.

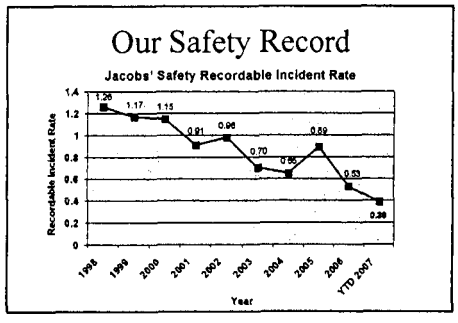
This significantly accelerates transferring electronic information; comments and questions generated on this project, as well as assists you in keeping records of plant documents in an organized electronic system.

2.5 HSE PROCESS

The objective of our HSE process is to enable our staff and other project team members to produce quality work, in a productive manner, without accident. Our definition of an accident is "an unplanned, undesirable event, which disrupts work activity". To achieve this, we promote a safety culture; emphasize accident prevention; strictly enforce HSE procedures; and continuously monitor HSE performance. Our approach involves all levels of our organization, client requirements, and contractor personnel.

We embrace a "Zero Accident" philosophy and have implemented a comprehensive HSE process. Our accident prevention standards define each level of management and employees' responsibilities. These standards ensure worker

safety and regulatory compliance. All of our employees are trained in our HSE philosophy, evaluated based on performance criteria and are held accountable for their performance.



Our program, processes and tools have facilitated consistent improvement in our OSHA Total Recordable Incident Rate. This positive trend is a direct result of our commitment to safety and the implementation of a HSE process that gets results.

The Jacobs HSE Manual is a company-proprietary document. In lieu of enclosing with this proposal the entire, large HSE Manual, we are providing the Manual's Table of Contents. The Table of Contents represents well over a thousand pages of comprehensive policies, procedures, and work instructions on a broad array of health, safety, and environment topics.

We have included a copy of our corporate *HSE Manual* Table of Contents in the Appendix for your review.

2.6 Project Support Services

Project reporting is an integral part of the project control process and is essential in keeping you informed of project status. The Project Team believes that the interaction of the Project Manager and your representatives is vital to assuring that the project is progressing as expected and that project objectives are being met.

Weekly meetings are established with key project personnel to check the current status of the project effort. Our monthly progress reports provide a summary of activities completed over the past month and activities planned for the next month; an update of the percentage of work completed by task; identification of any changes in work scope; a discussion of any project elements that are of potential concern; and a presentation of project costs to date versus budget.

2.6.1 Cost Estimating

The estimating process integrates engineering, project control and all disciplines in the development of a comprehensive capital cost estimate.

Our estimating system can generate four types of estimates:

- *Order of Magnitude Estimate* – This estimate is made prior to project definition and is used for determining economic feasibility.
- *Preliminary Estimate* – This estimate is more project specific and is often used for comparative economic analysis of alternatives.
- *Budget Estimate* – This estimate is used for cost control of engineering design projects, as well as for construction projects.
- *Definitive Cost Estimate – This is the most comprehensive estimate prepared for a project and provides the detailed targets for construction and schedule control. This grade of estimate is usually reserved for large construction projects.*

On this project we propose to develop a Budget Estimate to examine the Phase 2 alternative. The estimate requires such data as site plans, equipment arrangements, flow diagrams, and major equipment lists, and vendor budget pricing for major equipment.

2.6.2 Cost Forecasting

Cost forecasting is a management tool for early identification of cost and schedule variances. This process assures that the project receives the information required to measure performance, revise estimates, prepare cash flows, track quantities and determine project status by earned performance.

The cost forecasting analysis effort is prospective in nature rather than retrospective in that emphasis is given to providing early visibility into potential problem areas and providing an early warning system.

Due to the fast track nature of the project study, cost forecasting is a control technique for systematically reevaluating the cost, schedule and technical performance of any project every month. It is designed to update the current status of a project, incorporate all trend items and to predict future performance of cost, schedule and productivity factors for timely management decisions.

The Forecast System provides an integrated evaluation that is directly related to the estimating, budgeting, scheduling and reporting systems. Whenever operating conditions reveal a potential deviation from the project baselines, the Forecast System provides the vehicle to prepare, store and display a

plan that reflects the anticipated resources needed to complete the approved task.

The Trend Program is another control tool that is used for tracking and providing information in controlling project scope, cost and schedule. The Trend Program provides a mechanism for identifying changes in the project scope; the scope of services to be provided; the intended plant/program site quality and the current project plan.

2.6.3 Cost Control Process

Successful project execution requires effective planning and control. Our project control systems provide timely cost and schedule information necessary for successful completion of this project on time and within budget. Cost engineering begins with the development/approval of a work breakdown structure (WBS) list for the project identifying document deliverables that need to be developed and issued.

The list is input in a computerized system, which identifies the milestones for each type of drawing or specification. Budgeted work-hours for each line item are also input and, on a monthly or bimonthly basis, the lists are statused and updated. Credit for milestones is based on having fully completed the milestone.

Actual cost data for Professional Services is structured in accordance with the WBS and matches the budget in terms of breakdown and/or summary, so we are able to compare performance (earned valued) against actual cost. From that comparison, project productivity and forecasts are computed.

Performance is reported on an overall basis with a graph that compares Planned Progress to both Actual Progress and Forecasted Progress.

2.6.4 Cost Reporting

A formal cost report is issued once a month. This report contains management summaries of cost and schedule status as well as a detailed analysis of all significant changes since the previous report. The project cost report covers engineering status, and all field activities, and is integrated into the Monthly Project Status Report.

2.6.5 Quality Management Program

The Jacobs Project Team defines quality as "conformance to properly developed requirements". The overall goal of our Quality Management program is to achieve the highest possible quality of performance.

Primary reliance for quality of performance is placed upon individuals. Each Project Team member is accountable for the quality of their personal performance, and Project Manager for the collective quality of performance of those who are accountable to them. The concept of self-accountability applies to all members and emphasizes the important responsibility of every individual employee for high quality personal performance. The Project Team, under the direction of the Project Manager, assisted by the Quality Assurance Manager, applies and advances the quality process to benefit the overall project.

The essential function of the quality management program is to assist employees and managers to meet the program goals by providing a framework of policies, procedures, standards, guidance, and methods for conducting and reviewing project work. This does not eliminate or reduce the quality assurance responsibility of individuals or managers; rather it adds emphasis, reinforces, and provides assistance.

The Project Team's approach to quality management stresses careful activity planning, documentation of all activities and results, and translation of the results into a report.

As part of a Quality Management effort we prepare a contract-specific QA plan that provides a description of the contract organization, the scope of work and contracting requirements; our management approach; the assignment of specific management, technical and quality functions, duties, and responsibilities; management of subcontractors; and the management information system.

Our quality assurance program specifies procedures for calculations, database and spreadsheet design, and document preparation and review including design criteria, specifications, reports to regulatory agencies, and project technical reports. The program references standard procedures for field data collection and analytical performance in accordance with requirements. The project organization establishes the position of Quality Assurance personnel as responsible for implementation of the project QA program for the activities of the team working in conjunction with the Project Manager.

2.6.6 Scope Change Management

The Scope Change Management System is an established method for the timely assessment of the effect of scope changes on a project. This system records this effect and provides a basis for the amendment of contractual documents, when such action is necessary. This provides both our team and Progress Energy with a disciplined process for promptly and effectively incorporating changes into the job plan and control budgets. The objectives of the Change Management System are to:

- Provide a disciplined approach for the identification, evaluation, coordination, approval and execution of changes
- Maintain the integrity of the scope, budget and schedule baselines
- Incorporate changes in a timely manner into the appropriate baselines

Any changes to the scope, schedule and budget are documented by the Change Notice (CN) and the Change Order (CO) procedures. The CN/CO procedures, in conjunction with the change order logs, provide a method of controlling deviations from expected costs as defined by the scope of work and current budget. All change notices are processed through the project team, thereby alerting them of any changes in the project scope, cost, schedule or technical configuration. Upon internal review and approval, the change notices are issued to you for review. You indicate by signature authority whether the change should be implemented or not.

Section 3
Qualifying Experience

RELEVANT POWER EXPERIENCE

Fuel Tech / Duke Power
SNCR Projects

Allen Station Client Survey

- *95% client survey for detail engineering*
- *100% client survey for construction management*

"The project team showed a strong understanding of project needs and demonstrated a high sense of urgency to get things done."

Fuel Tech Client Survey

We have provided engineering and construction management services for the Fuel Tech / Duke Power projects for 13 units at 4 Duke Power plants shown below:

- **Allen Station Units 1 thru 5**
- **Marshall Station Units 3 and 4**
- **Buck Station Units 5 and 6**
- **Riverbend Station Units 4 thru 7**

Allen Station has five Units consisting of eight furnaces. Units #1 and #2 each have one furnace. Units #3, #4 and #5 have a Superheat furnace and a Reheat furnace. We have provided engineering services for the selective non-catalytic reduction (SNCR) of NOx system installation for Unit #1, #3 and #4 at Allen Station and Units #3 and #4 at Marshall Station. We are currently providing services at Allen Station Units #2 and #5 and at Riverbend Station Units #4, #5, #6, and #7.

Progress Energy Alliance

Jacobs and Progress Energy (formerly CP&L) have worked under an alliance structure for plant engineering projects since 1996. In 2001, this relationship expanded to include Progress Energy Florida (formerly Florida Power). In addition, we have worked extensively with Progress Energy Ventures (PEV) in support of their capital program.

Overview

11	Fossil plants in Carolinas (regulated)
4	Fossil plants in Florida (regulated)
7	Combustion Turbine plants (unregulated)
22	Total sites

- Over 100 Combustion Turbines in the system
- Average 30+ projects per year, growing
- 30 year history – 6 years as a formal Alliance

Jacobs has Provided:

- Studies
- Budget estimates
- Authorization grade estimates
- Plant engineering design
- Trouble shooting
- Major capital project design
- Owners engineering services

Owner's Engineering Services Include:

- Prepare bid specs for vendor turnkey projects
- Document review on third party work
- Contract conformance
- Witness testing
- Site development services
- Program management of multiple contractors
- Project cost services

Small Project Program Benefits:

- Minimized administration and procurement cost
- Shared knowledge across system
- Team continuity – alignment
- High confidence of success
- Staff augmentation / flexibility
- Cost-effective / expedient service
- Consolidated project reporting

Progress Energy Project Listing

Progress Energy
Raleigh, North Carolina
We provided balance of plant engineering services for the installation of 12 simple cycle 160-MW combustion turbines for Progress Energy at four locations in North Carolina. The work included design services for balance of plant electrical, piping, and structural. At two locations, the work also included the grading, drainage, and soil and erosion control design.

Rowan County Phase II & III

"Jacobs has done an outstanding job. There were no glitches in understanding the scope of work."

"Overall, the project went very well. Jacobs adapted quickly to a project that had many constraints. Jacobs' staff took the initiative to retrieve the information that they needed without bothering Progress Energy. This reflects the quality and experience of the staff. Jacobs did an excellent job. Progress Energy looks forward to the next one."

Jack Sparks & Warren Hilliard
Progress Energy

Carolina Power & Light, Co., Richmond County Plant
Richmond County, North Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 8 G.E. Frame 7FA units, 4 initially in simple cycle operation and 4 in combined cycle operation. Simple cycle units are designed to be converted to combined cycle operation in future. Responsible for review of all aspects of design, by the equipment suppliers and the turnkey contractor. Also responsible for all balance of plant design, including site grading, drainage, and paving, interconnection of utilities within facility as well as coordination of interconnection with local utilities, and design and coordination of installation of combination control building/warehouse/shop. Involvement also includes selection of source of water, selection of engineering firm for design and construction management, and review of water system design.

Carolina Power & Light, Co., Rowan County Plant
Rowan County, North Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 3 G.E. Frame 7FA units, initially in simple cycle operation and provision for future addition of 2 units in combined cycle operation. Simple cycle units are designed to be converted to combined cycle operation in future. Responsible for review of all aspects of design, by the equipment suppliers and the turnkey contractor. Also responsible for all balance of plant design, including site grading, drainage, and paving, interconnection of utilities within facility as well as coordination of interconnection with local utilities, and design and coordination of installation of combination control building / warehouse / shop. Involvement also includes selection of source of water, selection of engineering firm for design and construction management, and review of water system design.

Carolina Power & Light, Co., Wayne County Plant
Goldsboro, North Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 4 G.E. Frame 7FA units, initially in simple cycle designed to be converted to combined cycle operation in future. Responsible for review of all aspects of design, by the equipment suppliers and by the turnkey contractor. Also responsible for all balance of plant design, including site paving, interconnection of utilities within facility as well as coordination of interconnection with local utilities, and design and coordination of installation of combination control building / warehouse / shop. Project also included specification and design of a new filter plant to supply water to both the new CT operation as well as existing coal fired operation located adjacent to new CT plant.

Carolina Power & Light, Co., Asheville Plant
Asheville, North Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 2 G.E. Frame 7FA units, initially in simple cycle designed to be converted to combined cycle operation in future. Responsible for review of all aspects of design, by the equipment suppliers and by the turnkey contractor. Also responsible for balance of plant design, including site paving, interconnection of utilities within facility as well as coordination of interconnection with local utilities. Also included study and design of new access road into plant for receiving large quantity of fuel oil trucks in winter.

Carolina Power & Light Co., Darlington County Plant
Hartsville, South Carolina
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 2 – Seimens-Westinghouse Frame 501D units in simple cycle operation. Responsible for review of all aspects of design by the equipment suppliers and by the turnkey contractor.

Carolina Power & Light Company
Darlington County, South Carolina
Complete design responsibility for 630 MW of combustion turbine-generators. This project included eleven (11) turbine-generator units designed for simple-cycle operation, fuel storage, 230 kV switchyard, remote controls and all associated auxiliary facilities. The plant was also designed and laid out for the future installation of waste heat boilers and steam turbine generators. The facility was completed and on-line only 15 months after initial Jacobs/Client conference and came in under estimated cost.

Carolina Power and Light Company
Raleigh, North Carolina
Complete engineering design services for the installation of two waste heat boilers at the Cape Fear Plant. These boilers produced 177,000 pph steam each utilizing the waste heat from IC turbines exhaust system. This resulted in a combined cycle operation efficiency of 41% for the facility utilizing the two existing GE combustion turbines. Engineering included designing required interfaces and modifications to facilitate the conversion to combined cycle operation.

Carolina Power & Light
Roxboro, North Carolina
Unit 1 - 360 MW; Unit 3 - 720 MW; Unit 4 - 720 MW
Units 3 and 4 are dual boiler units

The Roxboro plant is located near Research Triangle Park in Raleigh. We have performed a number of study and design assignments on these units. The station has three Riley stoker units with double reheat and superheaters. Among the assignments were:

1. Retrofitted Unit 3 with an electrostatic precipitator.
2. Performed study and design on Unit 4 and added a gas recirculation system to improve unit rating. System included fans, ductwork, and controls.
3. Performed studies and design to correct cooling water exchanger system overloads and turbine backpressure on Units 1, 2, and 3.

4. Performed studies and preliminary design to retrofit flyash handling for the four units at Roxboro. Currently working on design.
5. Performed study and made recommendations for control and test of water chemistry system and additional Unit 3 cooling.
6. Upgrade the 8-cell cooling tower and the 6-cell cooling tower.

SCE&G Experience

In addition to our experience with Progress Energy we have also provided engineering and construction support to SCE&G. The following is a listing of projects that we have completed for SCE&G.

Wateree Station (Eastover)

- **Engineering Study and cost estimates for conversion to Closed Cycle Cooling System.**
- **BOP Engineering for House Service Cooling Towers relocation, Fabric Filters, and SCRs.**
- Controls Engineering Services for PLC and DCS (WDPF and Ovation) upgrades on various systems.
- Engineering Services for painting the main stacks.
- Engineering Study of boiler structure wind bracing repairs.
- Engineering Services for small projects.

SCE&G EPCM Cooper River Bridge Tunnel

- 115kV Submarine Cable – 7000' tunnel for new 10,275' transmission line
- EPCM contract
- EPCM contracting selected as offering the best balance between risk, schedule, and price

McMeekin Station (Lake Murray)

- Engineering for replacement of the 60" Circulating Water Supply and Return Headers. This project is similar to the CCCS in respect to the large circulating water headers.
- Engineering for foundation for Bottom Ash & Pyrites Silos.
- Engineering for various small projects.
- Engineering Support for paving & drainage on the East Side of the plant.
- Engineering Study of the turbine gland seal steam regulator piping.
- Engineering for revision to Service Water piping and pumps.
- Engineering for relocation of Hydrogen Storage.
- Engineering Analysis of three Fuel Oil Unloading locations.

Williams Station (Goose Creek)
- Engineering to convert the boilers from oil to coal fired.
- Front End assistance to scope BOP engineering for SCRs.
- Engineering for PLC Upgrades on Ash Handling and Coal Handling.
- Engineering for Filter / Separator support on top of Ash Silo.

SRS (Savannah River) "D" Powerhouse
- Study to define upgrades required to improve reliability and controls at new load conditions.

Other Relevant Experience

Alstom Power (formerly ABB)
Currin County, California
We were contracted by Alstom Power to provide design engineering services for a 1,048 MW combined cycle power plant near Bakerfield, CA. The plant consists of four natural gas fired, single shaft GT 24 combustion turbine-generators, heat recovery steam generators, steam turbines, and associated plant equipment.

We provided mechanical, civil, structural, piping, electrical, and control systems engineering for balance of plant systems including main cooling water, fuel gas, water supply, waste water collection, compressed air, and ammonia storage and handling. We prepared equipment specifications for the cooling towers, miscellaneous pumps, fire protection systems, fuel gas conditioning equipment, and air compressors; as well as construction specifications. We prepared all civil design for the project, as well as foundation and steel design for the HRSGs and Turbine Generator Building.

Confidential IPP Project
Northwest U.S.
- Jacobs is the EPCM contractor
- GE 7-FA 1x1 Combined Cycle – 290 MW
- Maximum duct firing, dual fuel, inlet cooling
- Sliding pressure HRSG design for load flexibility

Delmarva Power & Light Company
Wilmington, Delaware
Preparation of a study for 20 year life extension of three coal-fired units at the Indian River Plant. The study included site improvements, rotary car dumper, conveyors, crusher house, transfer towers, bunkers, coal mills, coal piping, and coal feeders for all three units. Plant is a four-unit station with one unit burning low sulfur coal and a unique coal handling

arrangement. Study and estimate was completed and a phased improvement plan prioritizing the work over a 3 year span was included.

Desoto County Power, LLC
Desoto County, Florida
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 2 – G.E. Frame 7FA units in simple cycle operation. Responsible for review of all aspects of design by the equipment suppliers and the turnkey contractor.

Effingham County Power, LLC
Effingham County, Georgia
Subsidiary of Progress Energy, Inc. – member of Owner's engineering team for selection of source of water for cooling tower makeup for 2 G.E. Frame 7FA units in combined cycle operation. Involvement includes selection of source of water, selection of engineering firm for design and construction management, and review of water system design. Project includes the provision for the utilization of municipal reuse water for makeup.

ER&L
Duplin Cogeneration
Turnkey bid and initial design, state-of-the-art pulverized coal fired boiler. One of first PC boilers permited as BACT with DNC (Dry NOx control) with an outlet of 0.03 lb/MMBtu. Facilities serves an ethanol plant. Power facilities included pulverized fired boiler (420,000 lb/hr, 1,550 psig, 1005 degree F steam), 26-MW non-condensing turbine, 100% auxiliary boiler back-up, water treatment, and balance of plant auxiliaries.

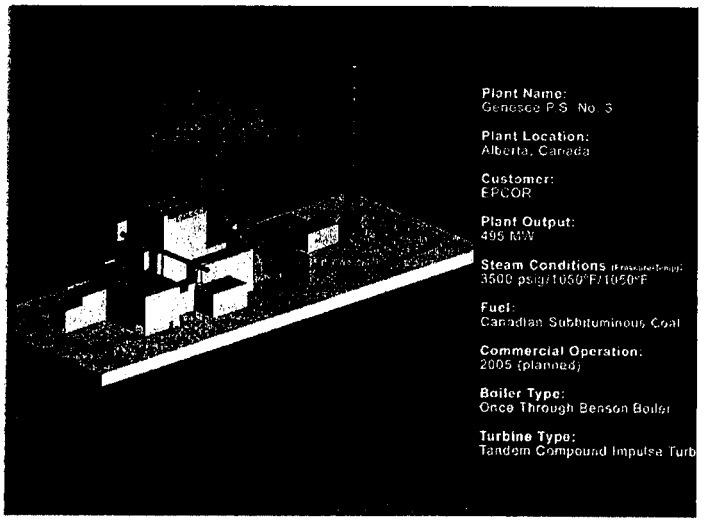
General Electric
Gebze, Turkey
Provided balance of plant engineering for a Frame 9E (123-MW) power project with provisions for a future HRSG and steam turbine addition. The installation was for Colakoglu Metals.

General Electric
United Arab Emirates
Provided balance of plant engineering for 5-MS 6001 B gas turbines installed at four facilities (Al Nakheel, Dhaid, UAQ, and New Qidfa).

Hillman Ltd.
Hillman, Michigan
Jacobs contracted as the turnkey design / construct contractor for this 17 MW wood-fired, small power production facility. Engineering services included licensing assistance, performance testing and certification. The power sales agreement is with Consumers Power Company. The client was Stockmar Energy, a subsidiary of the Philadelphia Leasing Corporation. The project completion and commercial operation date was February 1988.

Hitachi – (EPCOR)
Edmonton, Alberta, CanadaJacobs is the BOP engineer and constructor for a 500MW super critical coal-fired power plant under Hitachi as EPC contractor. Plant includes a wet FGD system.

Hitachi's 495MW Genesee 3 PlantAlberta, Canada



Hopewell Cogeneration
Hopewell, Virginia
Provided study, development, design review, and construction startup assistance for a 356 MW gas turbine combined cycle cogeneration facility which included three (3) 89 MW gas turbines, three (3) HRSG's, one (1) 98 MW steam turbine, cooling tower, water treatment plant, and associated auxiliaries. The project was awarded to ABB, and we managed the turnkey contract. This facility is fully dispatchable with the electric power being sold to Virginia Electric Power Company. The steam is sold to Aqualon Company.

L'Energia, Limited Partnership
Lowell, Massachusetts
Provided design, procurement and construction for an 81.6 MW combined cycle cogeneration power facility. The plant is designed with a Siemens V64.3 gas turbine, heat recovery steam generator, and a two-stages condensing steam turbine generators. The facility utilizes state-of-the-art dry combustor technology and interconnects to the New England Electric Company system. The steam is sold to Borden Inc.'s Prince Pasta Plant. Jacobs services included design, procurement, construction, and construction oversight, as well as training, performance testing and startup.

LaPaloma Power, LLC
Kern County, California
Furnished Engineering services for the LaPaloma Power Project. The plant consists of four 1 on 1 combined cycle units using Alstom GT 24 single shaft gas turbines with a net electrical output of 1,048 MW. The units are fueled by natural gas. Jacobs scope includes civil, structural, architectural, mechanical, electrical, and control engineering services. Major systems designed include main cooling water (cooling tower), fuel gas preparation, compressed air, waste treatment, plant water distribution, site work, and all foundations. The project is scheduled for start-up 1st quarter 2002.

Unique challenges to this project included the rigorous plan approval process in California, seismic design issues, and fast track nature of the project considering the current energy situation in California.

Lakewood Cogeneration
Lakewood, New Jersey
Design and engineering for a 236 MW combined cycle cogeneration facility including two 80 MW dual fuel combustion turbine generators with dual pressure heat recovery steam generators, an 88 MW extraction, condensing turbine generator, auxiliary boiler, cooling tower, water treatment plant and associated auxiliaries.

Monroe Power, LLC
Monroe, Georgia
Subsidiary of Progress Energy, Inc. – Owner's engineer for installation of 2 – Seimens-Westinghouse Frame 501D units in simple cycle operation. Responsible for review of all aspects of design by the equipment suppliers and by the turnkey contractor.

Northwest Energy (Williams Lake) Limited Partnership
Williams Lake, British Columbia
Completed a 60 MW wood-fired generating station for NW Energy. The $92 million EPC turnkey project greatly exceeded performance standards in all areas including heat rate and power output. The particulate and NOx emissions were well below limits. Jacobs also provided operations and maintenance manuals, operator training, startup and performance testing.

The facility improves air quality by disposing of sawmill wood waste in a more environmentally controlled method than the beehive burners at five local lumber yards. The wood waste is prepared to a size required by the fuel handling system to generate 60 MW of electric power to be sold to B.C. Hydro under a 25-plus year agreement. The boiler produces 561,750 pph of steam at 1550 psig and 950°F. The plant has a design plant life of 35 years.

Based on the success and excellence of the Williams Lake project, NW Energy Corp. received the 1992-1993 *Project of the Year Award* from the Project Management Institute, West Coast British Columbia Chapter. The project was also recognized as Consulting Engineers of South Carolina's 1994 Best of Show and received First place for Energy Production / Conservation.

Northern States Power Company
Minneapolis, Minnesota
Design and procurement for the conversion of four 12.5 MW utility units from stoker coal firing to refuse derived fuel firing. The conversion of two units at NSP's Red Wing Station includes a RDF receiving and storage station, RDF reclaim and conveyor to the powerhouse, new boiler feeders, boiler modifications, and new ash handling equipment. Red Wing will be an RDF dedicated system. The two units at Wilmarth Station will receive similar modifications and additions, but will retain coal firing capability as well as RDF capability.

Savannah Electric Power Company
Port Wentworth, Georgia
Unit 1 - 50 MW; Unit 2 - 50 MW; Unit 3 - 100 MW
Oil Fired

Conversion from oil to coal firing. The conversion to coal required boiler inspections, economizers, superheaters, and burner replacement. The conversion required the retrofit of new precipitators, new flyash handling systems, new I.D. fans, a new stack, and new breeching and ash disposal.

Stratton Energy Associates,
Stratton, Maine
Executed a turnkey design-construct contract for this 40 MW wood-fired, independent, power producing facility. The facility consists of a spreader stoker, traveling grate, water wall boiler burning wood chips and residue to generate 400,000 lbs/hr of steam at 1485 PSIG at 955°F to power a 45 MW (gross) turbine generator.

Viking Energy
Lincoln, Michigan
As the turnkey contractor to Viking Energy, we provided complete preliminary and final design, licensing assistance, cost estimating, procurement and construction services for this 16 MW wood-fired small power production facility adjacent to Hill Forest Products sawmill.

Virginia Electric and Power Company
Richmond, Virginia
Responsible for developing scope for the conversion of three oil-fired units to coal firing. Project included structural, electrical, instrumentation, piping, etc. for ash handling, ID fans, and air emissions control equipment.

Responsible for all design and engineering data required for retrofit of electrostatic precipitators and auxiliary equipment on four existing units at three locations. These units were converted from oil to coal firing. The project included foundations, erection of structural steel, ductwork, ash handling equipment, piping, stairs, ID fans, etc. Also included were insulation and painting of equipment.

Possum Point Unit 3	-	175 MW
Yorktown Unit 2	-	180 MW
Chesterfield Unit 3	-	105 MW
Portsmouth Unit 3	-	170 MW
Portsmouth Unit 4	-	245 MW
Chesterfield Unit 4	-	175 MW
Possum Point Unit 4	-	240 MW

Virginia Electric and Power Company
Portsmouth, Virginia
Unit 3 - 170 MW; Unit 4 - 240 MW
Oil- and Coal-Fired

Conversion from oil to coal firing. The conversion to coal required boiler inspections and burner replacement. A new fly ash handling system and rework of the bottom ash system were included. Retrofit of electrostatic precipitators for each

unit was accomplished, and I.D. fans were reworked on Unit 3 and Unit 4.

Virginia Electric and Power Company
Portsmouth, Virginia
Design / construct turnkey contract for the life extension and uprate of two 100 MW units at Portsmouth, Virginia. These units were uprated to 120 MW each and reconverted to coal firing. Extensive rebuild of the coalbunkers, piping, pulverizing equipment, fans, and ash handling system was required. Instrumentation, condensers, turbine generators, and air pollution control equipment were replaced. The steam generators were retubed and modifications to steam and condensate piping were included.

Westwood Energy Properties
Joliett, Pennsylvania
We provided engineering, procurement, financial arrangements, and construction services; managed construction, and purchased all equipment and bulk materials. The project generates a nominal 30 MW of electric energy for sale to a public utility by burning coarse anthracite mining refuse (culm) in a circulating fluidized combustion boiler.

Section 4
Commercials

Jacobs is pleased to have the opportunity to propose our services to Progress Energy regarding the Crystal River Discharge Canal Cooling Study. We believe our offering has addressed the issues stated in your RFQ. We look forward to meeting with you to discuss our offering and optimize our ability to work with you in pursuit of your goals.

HOURS ESTIMATE

Phase 1

REDACTED

We estimate Phase 1 requires [redacted] hours to complete, based on the scope of work described in your RFQ and the proposed scope of services provided in this proposal.

Phase 2

REDACTED

We estimate Phase 2 requires [redacted] hours to complete, based on the scope of work described in your RFQ and the proposed scope of services provided in this proposal.

COMMERCIALS

REDACTED

We propose to provide our services on a [redacted] under the terms and conditions of the Master Engineering Agreement between Progress Energy and Jacobs Engineering dated May 1, 2000. We will not exceed the value of the Purchase Order without prior approval from Progress Energy.

REDACTED

[redacted]

We look forward to working with you on this project. Please let me know if I can answer any questions or if you need any additional information. I may be reached at 864-676-6179.

CLASSIFICATIONS AND BILL RATES

For home or branch office personnel working in their home office, the following will apply:

Jacobs Engineering Office-Based Personnel –Bare Hourly Salary Rate Ranges

CLASSIFICATION	BARE HOURLY SALARY RANGE
Manager of Projects/ Process Specialists	REDACTED
Project Managers/ Department Managers	
Technical Managers	
Technical / Environmental Specialist	
Construction Managers	
Senior Project / Process / Mechanical / Civil / Structural / Electrical / Control Systems Engineers	
Process / Mechanical Engineers	
Senior Mechanical / Piping Designers	
Mechanical / Piping Designers	
Civil / Structural / Electrical / Control Systems Designers	
Senior Estimators / Purchasers	
Purchasers and Expediters	
Scheduler, Cost Engineer, Quality, Safety, Information Systems	
Document Control	
Secretarial and Clerical	
Lab Technicians / Chemist	
Accounting	

These rates are effective as of the date of this proposal and are valid until December 31, 2007.

Rates listed are bare hourly rates. Bill rates are subject to a multiplier of [redacted]er labor hour for "Other Direct Costs", as provided in the Master Engineering Agreement between Progress Energy and Jacobs Engineering dated May 1, 2000.

REDACTED

ESTIMATED COST

Phase 1

We estimate the total cost for this work on a time and expense basis is [redacted]which includes an allowance of [redacted]for travel. Reimbursable travel related expenses are billed at actual cost.

REDACTED

CONFIDENTIAL PEF-NCR-00341

Phase 2

REDACTED

We estimate the total cost for this work on a time and expense basis is [redacted], which includes an allowance of [redacted] for travel. Reimbursable travel related expenses are billed at actual cost.

BILLING PROCEDURES AND DOCUMENTATION

Invoices are submitted for professional services and travel expenses on a monthly basis and are payable within 30 days by wire transfer.

Jacobs Engineering Group, Inc.
Bank of America
Dallas, Texas
ABA: 111000012
International Swift Code: NBDLIQ21
Account #: 3750362891

This proposal is subject to acceptance within 30 days.

CONFIDENTIAL

Appendix

- Résumés
- Safety / HSE
- QA / QC
- General Information

Résumés

Name:	**KENNETH J. PLATA**
Title:	**Senior Project Manager**
Education:	B.S., 1976, Mechanical Engineering University of Tennessee Masters in Business Administration, University of Houston 1981 (1 year credit)
Special Training:	Total Quality Management Facilitator 1992 - 1995 Jacobs Project Management School – 2000 Jacobs Management Leadership Training - 2000
Registration:	E.I.T. - 1976 - Tennessee
Affiliations:	American Society of Mechanical Engineers Technical Association of the Pulp and Paper Institute

Mr. Plata has over 30 years of experience in the engineering, procurement and construction fields primarily serving the fertilizer, phosphoric acid, power, chemical, pharmaceutical and pulp & paper industries. Detailed experience has encompassed areas of environmental study and compliance, project due diligence and finance, pro-forma evaluations, process calculations and design, construction and project management for a wide range of capital cost projects. Project Management has ranged from conceptual studies and estimates, to approving, managing and coordinating on-site construction projects. Mr. Plata is a Senior Project Manager in Jacobs' Lakeland, Florida Operations.

Representative assignments include:

- Senior Project Manager/Project Engineer in providing detail design for a phosphoric acid plant revamp, in which the process was modified from dihydrate to hemihydrate. Client was confidential. The project was extremely fast track with the project schedule shortened from 15 months to 11 months for engineering, procurement, construction, start-up and commissioning. Duties included capital cost estimates, equipment selection, process revisions, layout modifications, budget control, resource loading, scheduling and overall project controls.

- Senior Project Manager in providing Basic Engineering Services for the $50MM expansion of the San Juan de la Costa mining and beneficiation operations for Grupo Fertinal S.A. de C.V. in San Juan de la Costa, Mexico. Specific duties included the development of the basic engineering package, and overall profit and loss responsibility for project costs. Assisted in process identification, equipment selection, site development, interaction with Mexican design firms and schedule coordination. Engineering package was at a level of detail to allow for a fixed cost estimate to be developed.

- Senior Project Manager for basic engineering and detail design services for the MAP/DAP production rate increase for the Lazaros Cardenas chemical plant for Grupo Fertinal S.A. de C.V. Project would boost production by adding a new pipe reactor in series with the preneutrailzer. Existing elevators and equipment were reviewed for capacity increase. Duties included capital cost estimates, equipment selection, process reviews, budget and project controls.

- Senior Project Manager for organizing and providing personnel for the pre-commissioning, start-up and commissioning of a new ammonium sulfate plant for the Lazaros Cardenas chemical plant for Grupo Fertinal S.A. de C.V. Project duties included monitoring activities for check-out and start-up, and advising client of problem areas where engineering solutions could be provided.

- Senior Project Manager for the conceptual feasibility study, AFE estimate and detail design for a new SPA/sulfur transload facility for PCS Phosphate, located in Lake City, Florida. The facility included railcar storage, molten sulfur unloading. Storage and loading to trucks.

- Senior Project Manager for two tissue machine rebuilds for confidential client. Project was schedule driven to meet specific product quality improvements and increased output. Major task was successfully managing both machine rebuild designs simultaneously on an extremely fast track schedule (8 months). Project objective was met with machine commissioning weeks ahead of planned start-up curve for both production and quality. Specific duties included capital cost estimates, equipment selection, process revisions, layout modifications, design reviews, budget control, resource loading, scheduling and project controls.

- Senior Project Manager for the road modifications and stormwater retention pond design for Progress Energy Crystal River facility. Project is part of the Marine Time Security Act (MTSA) requirements in conjunction with the terrorist security initiative. Project included road modifications, handling and storage of storm water runoff and addressing security concerns.

- Senior Project Manager for the initial process study and conceptual design layout and capital cost estimates for Bausch & Lomb in the Non-Sterile Pharmacy/Compounding areas, and Sterile Fill Compounding areas. Project effort addressed containment of Category 3 compounds, assessing operator exposure, product cross contamination and architectural access/egress requirements.

- Senior Project Manager in the development of a Comprehensive Environmental Study for Tampa Electric's Big Bend Station in Apollo Beach. The study included a detailed evaluation of plant process operations with emphasis on the generation and handling of coal combustion products, storm water management, and impacts to groundwater at or near combustion products management units.

- Senior Project Manager for a major modification to the industrial waste water system at the TECO Gannon power plant. This project is a portion of the major project valued at $800 MM.

- Senior Project Manager in the detail feasibility and conceptual design study for the installation of a new solid oral dosage pharmaceutical facility to be built in Miramar, Florida for Groupe Ethypharm. Work effort included process design, architectural design, validation and FDA review.

- Senior Project Manager for the specifying and design of a new neurotechnology system for low NOx burners as part of the environmental compliance requirement for coal fired boilers.

- Senior Project Manager for the design and procurement on an entrainment separator and new thermal mechanical compressor at the Polk Power Station. This project is part of the brine system improvement program.

- Senior Project Manager for the installation of a new slag handling system at the coal gasification plant as part of the Polk Power Improvement program. The construction effort completed one month ahead of schedule and on budget.

As a Senior Project Manager for Ford, Bacon and Davis, Inc., Mr. Plata's project activities included:

- $60 million wet flue gas desulfurization system for Southern Indiana Gas and Electric Company.
- Owner independent engineer, providing technical, market, construction and feasibility analysis for two (2) de-inking and recycle fiber projects.
- Site project engineer for the rebuilding of a reactor building, process equipment installation, start-up and commissioning for Merck Sharp & Dohme in Barceloneta, Puerto Rico.
- Various engineering studies for General Electric, Georgia-Pacific and International Paper.

As an Area Project Engineer, Mr. Plata's project activities included:

- $20 million project for a new chlorine dioxide plant and sodium chlorate modification.
- $12 million retro-fit of an existing chlorine dioxide facility from a sulfuric acid/chlorate process to an SVP-Methanol process.
- Provide design and engineering development for a new $40 million lime kiln and recausticizing system.
- $80 million capital cost improvement to an existing paper mill consisting of a lime kiln expansion, new recausticizing equipment, effluent treatment expansion, chlorine dioxide facility and tank farm.
- $15 million capital cost improvement to an existing paper machine with the addition of a new dryer section; reel relocation; new hydraulics system and the design/installation of a new roll handling system.

As a Mechanical Process Engineer, Mr. Plata was responsible for providing process engineering design, cost review, manpower requirements and on-site coordination for a wide variety of capital projects for Georgia-Pacific and Union Camp. Specific projects included paper machine rebuilds (wet end to dry end), recovery boilers, phenolic resin spray dryer, HVAC design for control rooms, MCC's and warehouses. Also provided engineering assistance on various surety type losses.

As a Piping Engineer Mr. Plata was responsible for providing engineering evaluations, detail design and specification for chemical and phosphate industries.

Operations Engineer for Gulf Oil in Port Arthur, Texas. Duties included operating and maintaining one of four power plants at the site.

Employment History:

Jacobs Engineering Group Inc. Senior Project Manager	1997 to date
Resolution Management Consultants, Inc. Senior Consultant	1996 – 1997
Ford, Bacon and Davis, Inc. Senior Project Manager	1992 – 1996
Parsons & Whittemore Construction, Inc. Area Project Engineer	1990 – 1992
BE & K Engineering/Construction, Inc. Project Engineer	1988 – 1990
Sandwell Engineering, Inc. Mechanical Process Engineer	1982 -1988
Raytheon Engineers Y Constructors, Inc. Piping Engineer	1981 – 1982
Brown & Root Engineering/Construction Mechanical Engineer	1978 – 1981
Gulf Oil, Inc. Operations Engineer	1976 – 1978

Name: **MICHAEL D. FINCH, PE**

Title: **Senior Drainage Engineer**

Education: BS, Civil Engineering, University of Missouri-Rolla, 1985

Registrations: Professional Engineer, Florida (40118), 1988

Affiliations: Member, American Society of Civil Engineers (ASCE), Since 1982
Officer, Ridge Branch/Florida Section 1997-2001

Member, Florida Engineering Society (FES), Since 1990
FICE Water Resources SWFWMD Liaison Committee Member

Member, National Society of Professional Engineers (NSPE), Since 1990

Member, Florida Floodplain Managers Association (FFMA), Since 2003, Chairman 2004

Citizen's Advisory Committee, Polk Transportation Planning Organization Member 2001-2007, Chairman 2005

Mike has more than 25 years experience with engineering planning and design, as well as project and construction management. As the Surface Water Management/CRS Coordinator for Polk County, he gained a familiarity with the specifics of your day-to-day business that will be an asset to you on this contract. He can provide expert services in the areas of environmental planning and design, hydrologic and hydraulic analysis, Surface Water and Flood Protection Management, plans review, code enforcement, and permitting.

Representative assignments include:

- Sawgrass Expressway Design Build from Atlantic Blvd. to Coral Ridge Drive, Florida's Turnpike Enterprise, Broward County, FL, Drainage Engineer of Record. Provided drainage design plans and permitting for roadway widening.
- Marco Island Bridge, FDOT District One, Collier County, FL, Drainage Engineer of Record. Provided drainage design plans and permitting for roadway and bridge reconstruction.(January 2006 to Present)
- I-75/SR 80 Interchange, Lee County, FDOT District One, Senior Drainage Engineer. Provided drainage design plans and permitting for roadway reconstruction. Also prepared Pond Siting Report. (January 2006 to Present)
- US 27, FDOT Districts One, Moorehaven, FL, Expert Witness. Provided expert witness services for inverse condemnation case on US 27.
- SR 5, FDOT District Five, Brevard County, FL Expert Witness. Provided expert witness services for right-of-way takings on SR 5.
- Polk Parkway, Section 3A and 3B, FDOT Turnpike District, Polk County, FL, Project Manager/Senior Drainage Engineer. Provided remedial drainage design, permitting, and coordination at Ramp F and Terrace Way.
- Sebring Parkway (Phase II) PD&E, FDOT District One, Highlands County, FL, Senior Drainage Engineer. Prepared Location Hydraulics Report, Conceptual Drainage Plan, and Pond Siting Report.
- US 27 (SR 25), SR 544 to Blue Heron Bay Boulevard, Polk County, FDOT District One,

Senior Drainage Engineer. Provided drainage design plans and permitting for rural/urban roadway reconstruction from 4 lanes to 6 lanes. Also prepared Pond Siting Report.

- I-595 PD&E Study, FDOT District Four, Broward County, FL, Senior Drainage Engineer. A planning study to develop and evaluate improvement alternatives for the I-595 expressway from I-75 to I-95. Responsible for conceptual drainage and environmental permitting. (2004)
- Southwest Florida Water Management District, Bartow Regulation Department, Surface Water Permitting Supervisor. Administrative and technical work supervising professionals and various technical support staff in activities relating to SWFWMD. Responsible for application receipt, administrative disposition, technical evaluation by staff, field inspection, legal review, and presentations.
- Southwest Florida Water Management District, Bartow Regulation Department, Surface Water Permitting Evaluator. Responsible for the technical evaluation of surface water permit applications for compliance with District rule criteria before permit issuance.
- Hillsborough County Stormwater, Hillsborough County, FL, Senior Water Resources Engineer. Provided engineering design, permitting, construction management and final certification services.
- Roy Haynes, Veronica Lake and Pine Lake Drainage Outfall Improvements, Hillsborough County Stormwater, FL, Senior Water Resources Engineer. Responsible for client coordination, stormwater modeling, plan/permitting preparation, and construction administration. The Project is located in the Curiosity Creek Watershed, Northwest Basin, Hillsborough County encompassing an area of approximately 530 acres. The Hillsborough County Public Works Department, Stormwater Management Section directed RS&H to evaluate and improve the existing drainage within the vicinity of Lakes Sophia and Pine, and Round and Pine Ponds, these areas flood during certain storm events, primarily due to being located within landlocked or localized closed basins. The sub-basins did not have a positive outfall; therefore the lakes/ponds within them accumulated stormwater runoff and historically were slow to recover, resulting in less than healthy systems. To help minimize flooding within these neighborhoods, interconnected gravity storm sewer systems and outfall control structures for Lake Sophia, Round Pond, Pine Pond and Pine Lake were designed. Additional flood storage was obtained by excavating around three of the interconnected water bodies. In conjunction with the proposed flood control excavation and storm sewer systems, three lakes had extensive restoration components implemented via the enlargement and/or addition of littoral shelves.
- Cypress Creek Water Control Structure, Operations Schedule Permitting, Tampa Bay Water, Pasco County, FL, Senior Water Resources Engineer. Permitted the implementation of an operations schedule for the water control structure in the Cypress Creek Wellfield. The purpose of the operations schedule was to retain water above the structure during times of high flow to increase aquifer recharge and increase rehydration of the Cypress Creek floodplain without causing stress or hydrological impacts to wetland and upland ecosystems upstream and downstream of the structure.
- Cypress Creek Wellfield (CCWF) Surface Water Management Project, Tampa Bay Water, Pasco County, FL, Senior Water Resources Engineer. Responsible for feasibility study preparation, design/permitting and construction management services for a multi-objective wetland restoration and surface water management project, for a 138 square mile watershed. The primary objective was to modify surface water drainage patterns resulting in improved wetland hydrology at sites in the eastern portion of the CCWF. An additional objective was to reduce nuisance flooding in adjacent residential subdivisions.

- I-595 PD&E Study, FDOT District Four, Broward County, FL, Senior Drainage Engineer. A planning study to develop and evaluate improvement alternatives for the I-595 expressway from I-75 to I-95. Responsible for conceptual drainage and environmental permitting.
- Ulmerton Road (SR 688), FDOT District Seven, Pinellas County, FL, Senior Drainage Engineer. Responsible for the design drainage system for the complete reconstruction of 2.3 miles of existing four-lane roadway to an urban six-lane divided facility from Oakhurst Road to 119th Street.
- Homestead Extension to Florida's Turnpike (HEFT), Miami-Dade County, Florida-Senior Drainage Engineer. Widening of HEFT to six lanes from SR 836 (Dolphin Expressway) Interchange to the Okeechobee Mainline Barrier Toll Plaza, a distance of approximately six miles. Improvements consist of modifications to the interchanges with the Dolphin Expressway, NW 41st Street, and NW 12th Street, and the addition of a collector-distributor roadway system and auxiliary lanes.
- Tampa International Airport Runway and Taxiway Modifications for Runway 36L, Tampa, FL, Senior Drainage Engineer. Design for an enlarged high-speed taxiway exit and reconstruction and enlargement of the existing run-up pad for runway 36L. Responsible for all drainage design/construction feasibility and permitting for the runway improvements as well as all drainage permitting for the Tampa International Airport Airside "C" apron.
- Lake Gibson Outfall Improvements, Howard Johnson, Lakeland, FL, Manager/Senior Drainage Engineer. Responsible for the preparation of design plans and environmental permitting of the stormwater conveyance system through the Howard Johnson property from Lake Gibson to the I-4 R/W. The existing outfall pipe had failed and was removed from service, requiring improvements to the outfall ditch.
- Pinellas County Utilities, Pinellas County FL, Senior Water Resources Engineer. Provided Utility Engineering Design, specifications preparation and permitting services for the construction/replacement of a triplex pump station.
- Marion County Parks Department and FDER Office of Greenway and Trails, Marion County, FL, Senior Water Resources Engineer. Provided utility engineering design and permitting services for the construction of several drinking water wells and sanitary septic tank systems.
- Southwest Florida Water Management District (SWFWMD), Bartow Regulation Department, Surface Water Permitting Evaluator. Responsible for the technical evaluation of surface water permit applications to ensure compliance with District rule criteria before permit issuance. Also, acted as the interim Field Services Supervisor.
- I-4 Way in Motion Station (WIMS), FDOT District Seven, Hillsborough County, FL, Senior Water Resources Engineer. Preliminary Design of two wells for the potable water systems and two sanitary sewer drain fields to service the new I-4 eastbound and westbound WIMS. Applicable permitting through the Hillsborough County Environmental Protection Commission and Hillsborough County Public Health Department was also performed.
- Administrator of Stormwater Management and Environmental Permitting, Head of the Drainage Design and Permitting Units. Directed and monitored staff and consulting engineers in the review, design and permitting of drainage systems for streets, roads and highways. The design and permits were coordinated with all applicable federal and state agencies, regulatory agencies, local governments, and private development. Provided interpretation, direction, and technical guidance in the application of Policies and Procedures, Design Guidelines, Standard Indexes, and other documents to consultant,

government, and FDOT personnel. Performed administrative tasks for the Unit. Prepared and maintained unit production schedules. Prepared and negotiated manhour estimates and scope of services. Screened potential consulting engineering firms for work associated with Department projects. Assisted in the development of the District's Work Program.

- Districtwide Drainage, FDOT District One, Senior Drainage Engineer. Provided field review, engineering analysis and design services for various design projects and drainage complaint investigations. (2002)
- General Water Use Permit Renewal Application (WUP #202023.007), Phoenix Industries, Winter Haven, Florida. Senior Water Resources Engineer. Phoenix Industries is an Industrial Complex, Public Warehouse Operation – Freezers, Coolers, and Dry Storage. Responsible for the Preparation of the SWFWMD application and documentation for six (6) wells with 125,000 gpd (6 year) and 137,5000 gpd (10 year) annual average quantity. (1999)
- Environmental Administrator, FDOT District One. Coordinated and negotiated with permitting agencies to obtain approvals. Other responsibilities similar to the Project Duties: Served as the Head of the Environmental Unit, directing the analysis of impacts relating to projects and serving as an environmental advisor to the District, also serving as the interface between FDOT, FHWA and environmental agencies. Responsible for supervising staff members in the accumulation, evaluation and review of information pertaining to highly complex environmental problems, which include noise, air quality, wetlands, threatened and endangered species, floodplains, water quality, historic/archaeological, socioeconomic statements, environmental assessments, categorical determinations, reevaluations, early notifications, 4(f) statements and environmental permits. (January 1993 to January 1994)
- Project Development Engineer, FDOT District One. Served as the Engineer of Project Development with the responsibility to supervise the Engineering Project Managers in the simultaneous management of projects, (Project Development and Environmental, PD&E Studies). Responsible for making independent judgments in providing the technical review and oversight of the engineering aspects associated with all PD&E studies to insure compliance with all applicable state and federal technical standards. Negotiated the scope of work and manhours on consultant related projects. (January 1994 to October 1994)
- Polk County Engineering Services Division, Surface Water Management/CRS Coordinator. Administrative and technical work supervising and coordinating the activities and assigned personnel in the administration and implementation of the provisions of the Flood Protection and Surface Water Management Code and Plan, Surface Water Protection Code, and FEMA/NFIP Community Rating System Program. (October 1990 to January 1993)
- Southwest Florida Water Management District, Bartow Regulation Department, Surface Water Permitting Supervisor. Administrative and technical work supervising professionals and various technical support staff in activities relating to SWFWMD. Responsible for application receipt, administrative disposition, technical evaluation by staff, field inspection, legal review, and presentations. (August 1988 to October 1989)
- Southwest Florida Water Management District (SWFWMD), Bartow Regulation Department, Surface Water Permitting Evaluator. Responsible for the technical evaluation of surface water permit applications to ensure compliance with District rule criteria before permit issuance. Also, acted as the interim Field Services Supervisor. (August 1987 to August 1988

Name: **RIGGIE C. SMITH**

Title: **Process Engineer**

Education: B.S., 1972, Mechanical Engineering, Clemson University, South Carolina

Mr. Smith has 35 years of process design engineering experience on power and pulp and paper projects. He has experience as an area project engineer, power department project engineer, total project engineer, and project manager.

Representative assignments include:

- Process Power Project Engineer, Duke Energy, Marshall Power Station. Lead on Study and Estimate of alternative boiler scenarios to replace the existing decommissioned package Auxilary Startup Boiler. Study considered replacing the existing boiler with either multiple trailer mounted rental boilers, a single larger package rental boiler or a permanent new package boiler.

- Process Power Project Engineer, Georgia-Pacific, Port Hudson, Louisiana. Design of a 60MW DAEC Turbine Generator with all associated auxiliary equipment. Auxiliaries included a Gland Steam Leakoff System, Lube/Control Oil System, Surface Condenser, Steam Jet/Inter-after Condenser System, Hotwell Pumps. Responsible for the interconnection of the existing mill steam system to the new Turbine Generator.

- Process Power Project Engineer, Georgia-Pacific, Monticello, Mississippi. Lead on Study and Estimate for a new Pet Coke Fired Circulating Fluidized Bed Boiler and Turbine Generator with all associated auxiliary equipment.

- Process Power Project Engineer, South Carolina Electric and Gas. Lead on Study and Estimate for a Closed Cycle Cooling System Project that converts the Unit 1 and Unit 2 Turbine Condenser Cooling Water System from once through to closed cycle. Two new field erected counter flow Cooling Towers and their associated auxiliary equipment are required to make this change.

- Power Project Engineer, South Carolina Electric and Gas. Design of plant engineering and assistance on Construction Packages for major plant outagees.

- Power Project Engineer, South Carolina Electric and Gas. Design of the Fly Ash System required for a major environmental project that included the installation of new fabric filter baghouses and SCR's for two super critical, pulverized coal fired boilers.

- Expert Witness – Power, Eimer Stahl. Assisted the law firm of Eimer Stahl through the arbitration trial as an expert witness for a confidential client in litigation with an independent onsite power producer.

- Power Project Engineer, Confidential Client. Planning for and implementation of an energy crisis project. The project consisted of installing a temporary steam system and a permenant electrical system for the mill's existing users.

- Power Project Engineer, Georgia-Pacific. Precipitator Rebuild Project. Addition of a new field and conversion to a dry bottom design on an existing precipitator that services a recovery boiler converted to a low odor design.

- Power Project Engineer, Mitsubishi. Utilities study for the addition of a new process line.

- Total Project Engineer, International Paper. Design project for the addition of a new chlorine dioxide plant with pulp mill modifications and associated energy modifications.

- Power Project Engineer, Confidential Client. Power house study for the addition of 600 psig package boilers and associated auxiliaries to support pulping modifications.

- Process Department Project Engineer, Sappi . Gas Burner Retrofit project for a CE, VU40 Coal Boiler to reduce NOx. Included damper and actuator replacement.

- Process Department Project Engineer, UNC Industrial Power, Odessa, Texas. Detail design of a 2.6 MW Gas Turbine Generator skid and enclosure including all on-skid and off-skid auxiliaries.

- Process Department Project Engineer, International Paper, Eastover, South Carolina. Study on pulp mill modifications and a chlorine dioxide plant expansion.

- Process Department Project Engineer, Confidential Client. Design and engineering on a 34 tons per day, R8 chlorine dioxide plant including balance-of-plant auxiliary equipment.

- Project Engineer, Department of Energy, Morgantown, West Virginia. Design and engineering on coal gasification project.

- Project Engineer, Confidential Client. Design and engineering on a 2,500,000 pound black liquor solids per day recovery boiler and its auxiliaries. The superheater outlet is rated at 1325 PSIG, 900°F.

- Project Engineer, NW Energy (Williams Lake Generating Station), Williams Lake, British Columbia. Design and engineering on a 60 MW condensing turbine generator with three uncontrolled extractions. Turbine generator has inlet steam conditions of 1550 PSIG, 950°F.

- Total Project Engineer, Sappi, Muskegon, Michigan. Study on 1350 PSIG, 900°F, 2,300,000 pound, black liquor solids per day recovery boiler and auxiliaries.

- Total Project Engineer / Project Manager, Sappi, Muskegon, Michigan. Technical coordination for project consisting of a 300,000-pounds per hour, 1350 PSIG, 900°F power boiler and a 25,000 kW turbine generator. The boiler fires pulverized coal and bark in suspension, with natural gas backup. Boiler is followed by a dry scrubber and electrostatic precipitator. Turbine generator has inlet steam conditions of 1300 PSIG, 900°F, and is a Single Automatic Extraction Non Condensing (SAENC) unit.

- Project Engineer, Confidential Client. Engineering and design on two turbine generators and their associated auxiliaries. Each turbine generator has inlet steam conditions of

1,325 PSIG, 925°F. One turbine generator is a Double Automatic Extraction Condensing (DAEC) unit rated at 61 MW. Second unit is SAENC rated at 43 MW. Responsible for operator training manuals for all project areas. Project included a 1,100-tons per day recovery boiler and a 685,000 PPH pulverized coal and biomass boiler.

- Project Engineer, International Paper Company, Georgetown, South Carolina. Design and engineering on two combination boilers rated at 425,000-pounds per hour steam (each) firing pulverized coal, bark, and oil with natural gas ignitors. Design and engineering included boiler auxiliaries such as air compressors, stock feeder, ductwork, drag conveyor, ash handling system, feedwater system, and dust collecting system. Project included two (2) 40 MW turbine generators and recovery boiler rebuilds.

- Power Engineer, International Paper, Sartell, Minnesota. Design and engineering on a combination boiler rated at 270,000-pounds per hour steam, firing coal, bark, and sludge, and related auxiliaries such as air compressors, stacks, and ash handling equipment. Also performed engineering on a 20,000 kW, 24,000 KVA, DAEC, back-pressure, air-cooled turbine generator and its associated auxiliaries.

- Power Engineer, Smurfit-Stone, Hopewell, Virginia. Design and engineering on a mill power plant expansion consisting of a 1,000-ton recovery boiler, a 500,000-pounds per hour steam combination boiler firing coal, bark, and hog fuel oil, and their related auxiliaries. Auxiliaries consisted of barrel boiler feed pumps, deaerator, air compressor system, demineralizers, polishers, No. 6 and No. 2 fuel oil systems, and miscellaneous equipment. Also responsible for design and engineering of a 35,000 kW, 56,000 KVA DAEC one uncontrolled extraction, condensing, hydrogen-cooled turbine generator and its associated auxiliaries.

- Power Engineer, Potlatch Corporation, Lewiston, Idaho. Design and engineering of a 9,220 kW, 12,875 KVA back-pressure, noncondensing, air-cooled turbine generator.

- Power Engineer, CIA Industrial, De San Cristobal, S.A., Mexico. Report and estimate for turbine generator expansion of bagasse mill.

- Power Engineer, Mead, Chillicothe, Ohio. Design and engineering on pump and auxiliaries and mill water study.

- Power Engineer, Potlatch Corporation, McGehee, Arkansas. Design and engineering on one (1) oil-fired 375,000-pounds per hour steam power boiler and related equipment, one (1) 20,000 kW, 32,000 KVA, SAENC turbine generator with related auxiliary equipment and No. 6 fuel oil system to supply oil to boilers.

- Power Engineer, Philip Morris USA, Bermuda Hundred, Virginia. Design and engineering on two (2) oil-fired 120,000-pounds per hour steam package boilers. Complete steam generating facilities with related pumps and auxiliaries.

Employment History

Jacobs 1973 – date

PEF-NCR-00355

Name: **JOSEPH S. DEMIDOVICH, JR., P.E.**

Title: **Sr. Civil/Structural Engineer**

Education: B.S., 1972, Civil Engineering, Case Institute of Technology

Registration: Professional Engineer, 1976, Florida, Nevada, Georgia, Michigan, Ohio, and North Carolina

Mr. Demidovich has over 34 years of experience, including 18 with Jacobs as a Sr. Civil/Structural Engineer. His structural steel, reinforced concrete, and civil engineering design/supervisory experience has been utilized in the design and construction of industrial plants serving the chemical, fertilizer, food, mining, petrochemical, plastics, synthetic fuels, metal, steel, paper, power, wood products industries and gypsum wall board industries. He has expertise in:

- Steel structures include multi-level buildings and towers, mill buildings, control houses, piperacks, conveyor galleries, multi-compartment hoppers, bins, crane runway systems, furnaces, large "preassemblies" involving overseas transport and site placement considerations

- Concrete structures include building, stack, and large equipment foundations such as large mats, pile caps, spread footings, ring walls, retaining walls, chemical containment basins, sumps and trenches.

- Civil work includes site preparation, drainage, dikes, underground piping/utilities, roads, bridges, and paving. Permitting with governmental agencies such as Southwest Florida Water Management District, Florida Department of Environmental Protection and State of Georgia Soil and Water Conservation Commission.

- Computer analysis includes use of programs such as STAAD (modeling both indeterminate building geometrics and finite element mat foundations), PCA mat programs, Ramsteel, site drainage programs – ICPR and Moderet, and personal computer programs.

- Supervision includes directing civil personnel, coordinating engineering problems with management, purchasing, scheduling, field, other design disciplines, vendors, and clients; developing layouts, plans, design criteria and specifications, manpower estimates, control schedules, status reports, and drawing lists; issuing drawings, bills of materials, and purchase requisitions; and reviewing bids.

Field engineering included a one-year job assignment on the methanol portion of a $2 billion gas-to-gasoline project. Responsibilities included overseas site liaison work and assisting construction managers, subcontractors, and quality control personnel; contract administration consisting of approving contractor requests and change orders; and directing the installation of utilities and roads under difficult soil conditions.

Representative assignments include:

- DAP Revamp for PCS in Aurora, NC – 2005
- 120 Ton/hr DAP Plant for OCP, Jorf Lasfar, Morocco
- Clean Air Access Roads and Drainage Project for Progress Energy, Crystal River
- Pure Acid Expansion Project for PCS in Aurora, NC – 2004
- Phosphoric Acid Plant Revamp for PCS in White Springs, FL
- Homeland Security Roads Project for Progress Energy, Crystal River, FL
- Gypsum wallboard expansion for PABCO Gypsum – 2004
- Gypsum wallboard wrap around expansion for PABCO Gypsum – 1998
- Phosphate Beneficiation Plant for CF Industries Inc.
- Lonesome Beneficiation Plant for IMC-Agrico, Lithia, FL
- Phosphate beneficiation plant upgrade for Mulberry Phosphates
- BIDCO feasibility study of the rehabilitation of the Linden, Guyana bauxite operations
- Dredge boom structural analysis for Standard Sand & Silica
- Four Corners Mine for W.R. Grace/IMC
- Phosphate rock beneficiation plant for CF Mining Corp.
- Coal beneficiation plant for U.S. Steel Corp.
- Sinter plant for Bethlehem Steel Corp.
- Sodium Chloride Plant for Sterling Pulp Chemicals, Ltd., in Muswellsbrook, Australia
- Scrubber Project for OCP, Safi, Morocco
- Pure Acid Expansion Project and Scrubber Project for PCS in Aurora, NC – 2001
- Wet Rock Grinding Conversion for CFI
- Phos Acid Reactor Encasement for IMC-A
- Pharmaceutical lab for IDDS in Miramar, FL
- Brine slag handling, compressor and pond modification projects for TECO
- Structural modification for Minute Maid Plant in Dunedin, FL
- Space Station processing facility for NASA at Kennedy Space Center, FL

- Phosphoric Acid Reactor Encapsulation Study for Serrana in Cajuti, Brazil
- Phosphoric acid debottleneck for PCS in Aurora, NC
- Phosphoric Acid Reactor, Oswal Chemicals and Fertilizers Ltd., Paradeep, India
- Two phosphoric acid plants for CNCCC in China
- Phosphoric acid plant for Chevron Chemical Co.
- Phosphoric acid upgrade for Texasgulf Inc.
- Phosphoric acid and granulation plants for Valley Nitrogen Producers Inc.
- Pharmaceutical Fine Chemicals, Sodium Naproxen Project, Freeport, Grand Bahamas
- LaRoche Industries Inc., Ammonia Nitrate and Nitric Acid Plant Upgrades, Cherokee, AL
- Sterling Pulp Chemicals, Ltd. Sodium Chlorate Plant, Valdosta, GA
- The Ledger Newspaper Printing Facility Redesign at Lakeland, FL
- Pharmaceutical plant for Syntex Pharmaceutical International Ltd., Freeport, Grand Bahamas
- HPAO project for Uniroyal Chemical Co., Freeport, Grand Bahamas
- Apache Nitrogen Products Inc. Reactivation of a Nitric Acid Plant
- 240-foot span A-frame storage building for Rhone-Poulenc Inc. at Green River, WY
- Steamline project for Texasgulf at Aurora, NC
- The Ledger Newspaper printing facility at Lakeland, FL
- Building renovation for Coca-Cola Foods at Auburndale, FL
- Belt filter building and evaporator additions to J.R. Simplot's phosphoric plant in Pocatello, ID
- Catalyst restoration plant for BP Chemicals in Lima, OH
- Oakbridge Land Development, a commercial/residential project
- Ultem-plastics plant for General Electric Co.
- Oil refinery for Kukdong Oil Co., South Korea
- Board plant for Georgia-Pacific Co.
- Methanol plant for New Zealand Synthetic Fuels Corp. and Mobil

- Aluminum continuous casting and rolling mill for Reynolds Metals Co.
- Polypropylene film plant for Hercules Co.
- Paper products converting plant for Procter & Gamble Co.
- Sulfur dioxide recovery unit for Getty Refining and Marketing Corp.
- Styrene-monomer plant for Rubicon Co.
- Coal liquification plant for SASOL II in South Africa
- Copper refinery for Cerro Steel Corp.
- Coke oven batteries for Inland Steel Co.
- Basic oxygen furnaces for Bethlehem Steel Corp.
- Wet rock grinding plant for Royster Co.
- Formaldehyde plant for Celanese Co.

Employment History:

Jacobs Engineering Inc. Civil/Structural Engineer	1988 to date
Drummond Coal Co. Civil/Structural Engineer	1986 – 1988
Badger Engineers, Inc. Civil/Structural Engineer	1984 – 1986
Baymont Engineering Co. Civil/Structural Engineer	1984 – 1984
Davy McKee Corporation Civil/Structural Engineering	1979 – 1983
Contract Status for Varying Engineering Companies	1977 – 1979
Badger Engineers, Inc. Civil/Structural Engineer	1974 – 1979
Dravo Corporation Civil/Structural Engineer	1973 – 1974
Koppers Company Civil/Structural Engineer	1972 - 1973

PEF-NCR-00359

Name: **FRANK S. HICKS**

Title: **Manager of Minerals Beneficiation Projects**

Education: B.S., 1971, Chemical Engineering, Georgia Institute of Technology

Affiliation: American Society of Mining and Metallurgical Engineers

Mr. Hicks has worked in the phosphate industry for over 30 years in both plant operations and as an industry consultant. He is Jacobs Manager of Minerals, Beneficiation Projects responsible for review and approval of minerals beneficiation projects. His duties include development of internal programs to develop and apply new minerals beneficiation technology, improved plant performance, plant testing, process modifications, development of process design and computer applications for process analysis, and evaluation of process alternatives, feasibility studies, and process selection. Mr. Hicks is also responsible for the definition and mitigation of environmental impacts of mining and waste disposal.

Representative assignments include:

- Lead Process Engineer for Mobil South Fort Meade mine, 3.4 million TPA and CF Industries Hardee County Relocation and Expansion, 3.5 million TPA mine.
- Lead Process Engineer for IMC Consolidated Mine Project.
- Lead Process Engineer for IMC Lonesome Mine 3.0 million TPA.
- Lead Process Engineer for IMC-Agrico Lonesome Beneficiation Plant, 2.5 million TPA.
- Process engineering for Cargill's expansion of South Fort Meade Mine including PFD's and P&ID's.
- Process development including metallurgical and pilot plant studies, process simulation, process economics, optimum equipment size, type, and service requirements.
- Review and approval of process configuration, base data and design for four new mines in Florida including a 2 million TPA mine for Farmland; a 3 million TPA mine for Mississippi Chemical Corporation; a 1.5 million TPA mine for USSAC, Fort Meade Extension; and a 3 million TPA mine for AMAX.
- Project Manager for pilot plant evaluation of magnesium levels and phosphoric acid manufacture for W.R. Grace.
- Process engineer for Georgia Pacific wallboard expansion project in Savannah, GA.
- Process engineer / Project Manager for gypsum beneficiation capital cost estimate for PABCO in Las Vegas, NV.
- Process engineer for detailed design of PABCO gypsum beneficiation plant.
- Process / equipment Engineer for preparation of a budget grade estimate for a gypsum wallboard expansion project for Domtar Gypsum in Sweetwater, Texas.
- Process Engineer / Project Manager for preliminary design package, which culminated in an estimate by the client for a $10 million specialty chemical plant.
- Process Engineer for Fertinal Beneficiation Plant expansion at San Juan de la Costa.

- Process Engineer for utilities area for Astaris Purified Phosphoric Acid Plant.
- Process Engineer for water retention pond modifications at TECO's Gannnon Plant.
- Project Manager / Investigator involved with several capital cost estimates for both chemical plants and mines in the central Florida area.
- Participated in due diligence evaluations for asset acquisitions for PCS, Cargill, and Mulberry phosphates. Evaluated assets and environmental liabilities during the course of those studies.
- Feasibility study participation and various studies for new mining ventures which include the Mexican, Colombian, Saudi Arabian, and Chinese phosphate projects, western phosphate deposit studies, and local Florida projects.
- Project Manager for feasibility study for the utilization of Tunisian wet phosphate rock and the manufacture of phosphoric acid.

In previous employment with Mobil Chemical Company at their Florida Phosphate Operations, he served as Senior Process Engineer. In this role, he was responsible for various aspects of the evaluation and improvement of existing operations. This work included plant testing, process modifications, and bench and pilot plant testing to improve existing process performance in two mining and beneficiation plants. Mr. Hicks worked on a semi-industrial scale waste clay settling project. He also developed computer programs for evaluating plant data to define operating costs as a function of plant conditions. In addition, he developed a program to report routine plant performance results.

He served as process engineer for Mobil on South Fort Meade mine development task force. His duties included process definition, permitting support, and client representative during preliminary engineering.

At Deering-Milliken Inc., he worked in production supervision and process engineering.

Publication:

"The Effect of the Environmental Permitting Process on Florida Phosphate Mining," with M.E. Zellars, March 1983, AIME Meeting in Atlanta, Georgia

Employment History:

Jacobs Engineering Group Inc. Manager of Minerals Beneficiation Projects	1981 to date
Mobil Chemical Company Senior Process Engineer	1976 - 1981
Deering-Milliken Inc. Production Supervisor Process Engineer	1971 - 1975

Name: NAN JORDAN

Title: Ecological Sciences and Environmental Project Management

Education:
Graduate Studies in Zoology, University of South Florida
University of South Florida
Florida Institute of Government Executive Fellows Program
B.A., Biology, University of South Florida, 1981

Ms. Jordan has over 24 years of experience in the environmental field including 15 years with the Department of Environmental Protection and 6 years with major international and local consulting firms. Her expertise includes environmental permitting, NEPA coordination, and Section 7 Consultation, ecosystem restoration, project management, mitigation construction project management and regulatory compliance specializing in wetlands, wildlife, water quality, aquatic ecology, and mitigation.

Representative assignments include:

- Magnolia Bay Marina and Resort, Secret Promise, Ltd., Keaton Beach, Florida and State, Environmental Project Manager. Project Manager for Environmental Resources Permit application coordination, field assessments and response for information requested from state and federal environmental agencies. Assisted in team oversight including the coordination of submittals from the design team work products and schedule. 2006-2007
- Lake Griffin SWIM Restoration Project, Lake County Water Authority, Environmental Project Manager for the permitting of the restoration of Lake Griffin in Lake County, Florida. The project involves suction dredging flocculent sediments from 29 canals surrounding Lake Griffin, to improve water quality, filter marsh treatment of discharge from the dredge material containment area and the restoration of a portion of the historic shoreline of Lake Griffin owned by the St. John's River Water Management District. Responsibilities included field inspections for wetlands, surface waters, threatened and endangered species; permit application preparation and processing, ERP and USACE permit coordination and negotiation meetings. 2001-2002
- CW Bill Young Reservoir, Tampa Bay Water, Construction Project Manager for the construction of the mitigation involving approximately 450 acres of wetlands that were created or enhanced and over 600 acres of upland areas that were enhanced and preserved. The mitigation was located on three separate areas to the east, north and west of the reservoir embankment, throughout the 5,200-acre site. These mitigation areas include restoration of agricultural land and the planting of over 1.5 million herbaceous plants, shrubs and trees. Responsibilities included oversight of construction compliance inspections for all environmental issues related to the project including mitigation construction, water quality threatened and endangered species, environmental permit compliance and agency coordination. 2002 – 2004
- US Highways 1 and 84, Georgia Department of Transportation. Environmental Project Manager for comprehensive terrestrial surveys for the presence and abundance of the eastern indigo snake, gopher tortoise and other xeric/scrub species along a half mile wide corridor for approximately 40 miles of roadway near Waycross, Georgia.
- Transportation Project Development and Environment Studies, Environmental Project

Manager for wetland evaluations threatened and endangered species assessments and water quality assessments required complying with NEPA, USFWS and FHWA requirements. Provided oversight of environmental project and sub consultant team regarding field reviews, agency coordination, document production and quality assurance/quality control (QA/QC). Select projects include:

- FDOT District One, I-75, PD&E Study, from north of Kings Highway to River Road, Charlotte, DeSoto and Sarasota Counties, Florida;
- Florida Turnpike Authority, State Road 528/Bee Line West Expressway PD&E Study from Interstate 4 to McCoy Road, Orange County, Florida
- FDOT, District One, I-75, PD&E Study, from SR 951 to the Lee/Collier County Line, Collier County, Florida
- FDOT, District One, I-75 PD&E Study from River Road to SR 681, Sarasota County, Florida
- FDOT District Five, SR 46 from PD&E Study from SR 15/600 to SR 415.
- FDOT District Seven, I-75 PD&E Study from Fowler Avenue to County Road 54, Hillsborough and Pasco Counties, Florida
- FDOT District Seven, Gandy Boulevard PD&E Study, U.S. Highway 19 to east of 4th Street, Pinellas County, Florida
- FDOT District Seven, I-4 PD&E Study, Polk County, Florida
- Jacksonville Transportation Authority, Heckscher Drive (SR 105) Phase II, PD&E Study, from Drummond Point to August Drive, Duval County, Florida
- Limited Access Corridor Study, FDOT District Three. The study area included a broad corridor from Panama City Florida to Dothan, Alabama and traversed Bay, Jackson, Holmes, and Washington Counties in Florida. Geographic Information System (GIS) data were used to determine the location of sensitive natural resources including listed species, wetlands and preservation and recreation lands and to develop three alternative corridor alignments that would avoid or minimize impacts. Responsibilities included environmental project management, agency coordination, document production and QA/QC.
- Old Fort King Trail, Hillsborough County, Environmental Project Manager for the permitting and design of 6.5 miles unpaved trail for equestrians, hikers and off-road bikes, and 2 miles of paved trail, and trail head parking and pavilions. Provided environmental project management services to obtain state, federal and local environmental permits including mitigation design, land acquisition and agency coordination.
- Transportation Permitting, Environmental Permitting and Mitigation Contract with FDOT District One Environmental, Project Manager for the General. Responsibilities included conducting wetland delineations, wildlife surveys, boat surveys; preparing ERP and US Army Corp of Engineers permit applications, agency coordination and in-house training of FDOT staff. Projects included:

- SR 31, Desoto County, Florida
- US 27, Polk County, Florida
- SR 70, Desoto and Okeechobee Counties, Florida
- Judge Jolly Bridge (SR 951) over the Marco River in Marco Island, Florida
- SR 62, Hardee County, Florida
- Southwest District State of Florida Department of Environmental Protection, Environmental Manager for the Environmental Resources Permitting, Compliance and Enforcement Program. She also served in numerous other roles including ombudsman for the northern counties of the district, and chairman of numerous state and district-wide committees. During her tenure with the Department, she was responsible for the following activities: (1985 to 2000)
- Development and implementation of the statewide procedures and penalty guidelines for the FDEP ERP compliance and enforcement program.
- Statute and rule development for trimming and alteration to mangroves.
- Supervision of wetland dredge and fill and ERP applications assessment.
- Management of the Southwest District Environmental Resources Compliance and Enforcement Program.
- Intergovernmental coordination to provide conflict resolution to citizens, elected officials, and county and local governments for environmental issues that were not resolvable through conventional Department mechanisms;
- Liaison to the legislative delegation and county commissions for Pasco, Hernando, Citrus, Sumter and Marion.
- Coordination with county governments to eliminate conflicting and duplicative requirements and prohibitions that resulted in inefficient government or placed hardships on the citizens;
- Provided public outreach and participation opportunities designed to create partnerships between the public and the FDEP.
- Developed of and chaired the Southwest Florida Environmental Crimes Task Force attended by appointed representatives from the US Attorneys Office, the US Department of Justice, the US Coast Guard, the EPA Criminal Investigations Divisions, and state and local attorney's offices, and environmental crimes investigators.
- Managed the FDEP Southwest District Water Chemistry Laboratory and the Ambient Water Quality Laboratory
- Provided expert witness testimony regarding wetlands, water quality, and environmental regulations.

Name: **HARISH H. SHAH, P.E.**

Title: **Manager – Mechanical and Piping Engineering**

Education: B.S., 1971, Mechanical Engineering, Tuskegee Institute
M.S. 1978, Engineering Administration, University of South Florida

Registration: Professional Engineer: FL, GA, MA, TN, ID, NC, SC

Affiliation:
FES: Florida Engineering Society
NSPE: National Society of Professional Engineers
ASHRAE: American Society for Heating, Refrigeration, and Air Conditioning Engineers
Past President FES Ridge Chapter – 1983-84
Nominee-Engineer of the Year-1997 FES Ridge Chapter

Mr. Shah has over 34 years experience in mechanical engineering and all areas of technical job management, plant design, HVAC, plumbing, project management, facilities engineering, maintenance management, client liaison and project coordination. Experience also includes supervising engineering and design personnel, coordinating work with other disciplines, writing specifications, engineering calculations, manhour estimates, schedules and construction cost estimates.

Projects include phosphate fertilizer plants, industrial manufacturing facilities, high rise office buildings, schools, department stores, swimming pools and other industrial, commercial and institutional projects. Record of progress to increasing responsibilities including project engineering and project management.

As the Mechanical and Piping Engineering Manager, Mr. Shah is responsible for the administrative supervision of all personnel in the department, assignment of engineers and designers to different projects, review project design, calculations, specifications and drafting activities for quality control on each project.

Representative assignments include:

- PMP – Phosphoric Acid Plant at Jorf Lasfar in Morocco
- PCS – DAP II Revamp Project at Aurora, North Carolina
- Tropicana – Design of a new wet end facility in Bradenton, Florida
- Mosaic – Lonesome Central Screening Station, Lithia, Florida
- OCP – 120 TPH DAP plant in Morocco & 1 TPH Pilot plant in Morocco
- OCP – New Phosphoric Acid Plant at Jorf Lasfar in Morocco
- PCS – Purified phosphoric Acid plant located at Aurora, North Carolina Train 3 & 4
- MAADEN – Feasibility Study for DAP Plant and Beneficiation Plant in Saudi Arabia
- OCP – SO2 scrubbing project and granulation plant modification project

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- Sterling Chemical – Sodium Chlorate plant located at Muswellbrook, Australia
- RPP – Several small projects including but not limited to Steam distribution system analysis, Instrument loop diagrams, Reactor relief valve and rupture disc replacement, Tank T-16 agitator replacement, etc.
- FMC – Purified Phosphoric Acid Plant located at Soda Springs in Idaho
- C F Chemical - Wet rock grinding modifications to acidic pond water system at Plant City, Florida
- Shell Chemical Co. - Several small projects including Instrument Loop and data base creations, Relief valve sizing on reactors and hot oil system, Preparing SGM's (Safe Guarding Memorandums) etc.
- Tampa Electric Co. – Several small projects including Gannon Bayside waste water pond water modification, Compressor installation etc.
- W. R. Grace – Phosphate Beneficiation Plant located at Hookers Prairie and Four Corners in Polk County, Florida
- C F Chemical Co. – Phosphate Beneficiation Plant in Hardee County in Florida
- IMC Corporation – Granulation Plant and Animal Feed Ingredients Plant at New Wales
- Barnett Tower – Twenty-seven story high-rise office building
- FDLE – Two story office and crime lab building for Florida Dept. of Law Enforcement
- Dillards – Eight thousand square foot stores in Orlando, Lakeland, Naples and Ft. Myers
- Polk County School Board – Polk Opportunity Center, Chapter 1 admin. Bldg. SSS bldg.
- Hillsborough County School Board – Tampa Palms Elementary School
- Hillsborough County School Board – Westside Elementary School
- Highlands County – Highland County Jail Renovation of existing jail and addition to existing jail complex Sarasota County Jail Design of new jail complex including food service facility
- Osceola County School Board – Osceola County Design of a new elementary school
- Honeywell Corporation – Renovation of existing facility and addition to existing manufacturing complex
- Namhae Chemical – Granulation plant in Korea
- New Mexico Power – SO2 recovery system

Name: **THOMAS C. SMITH, PE**

Title: **Senior Electrical Engineer**

Education: B.S., Electrical Engineering, University of Florida, 1987

Registration: Registered Professional Engineer, Florida, North Carolina

Mr. Smith has over eighteen (18) years of project management, design and construction management/start-up experience on chemical, pharmaceutical, pulp and paper, power generation and institutional projects. He has been a lead engineer on a variety of projects ranging from technical studies to full service EPC projects. His technical strengths are in power distribution, motor control, lighting, DCS/PLC interface, equipment specifications, calculations and studies. He is responsible for technical quality within the E&I department. Lead engineer responsibilities include development of professional service and total installed cost estimates, procurement of equipment and installation subcontracts, inspections and construction support. His ability to adapt to any assignment or environment is proven through the diversity of his experience. He has proficiency with several software packages including Microstation/Intergraph, AutoCAD, Microsoft Office Suite, EDSA and SKM Power Tools electrical calculations.

Representative assignments include:

- PCS Phosphate, Purified Acid Aurora, NC. Lead electrical engineer on the EPC project team responsible for the design, procurement and construction of an expansion to an existing purified phosphoric acid production facility. Project includes 25kV power distribution with 5000kVA transformers, electrically hazardous areas, subcontract and equipment procurement, and construction support.

- PCS Phosphate, HFSA/STF Aurora, NC. Lead electrical engineer responsible for the design and procurement on project to increase production of HFSA for feed to new production area producing STF. Expansion of HFSA production includes conversion of plant to A-B Control Logix PLC control and overhaul of motor control center with new GE Evolution MCCs including DeviceNet interface with PLC for motor control. New STF area includes 1500KVA substation with 3200A switchgear, A-B MCCs using DeviceNet control, A-B Control Logix PLC, lighting, grounding and heat tracing.

- Fauji Fertilizer, DAP Revamp Karachi, Pakistan. Electrical engineer responsible for the development of single line diagrams, load study and equipment specification associated with a conceptual engineering package for 50% increase in plant production. Design required evaluation of existing plant single line diagrams and equipment drawings to recommend upgrades to support project goals. Equipment based on IEC and metric standards.

- Mosaic, Lonesome Screening Station Lonesome, FL. Registered engineer responsible for the electrical and controls design of a phosphate ore screening station. Project required 69KV utility feed and 4160V and 480V distribution systems. Equipment included double-ended 10MVA substation and 2000A Siemens switchgear. Plant controls used A-B Control Logix PLCs.

- PCS Phosphates, DAP Revamp, Aurora, NC. Engineer supporting plant revamp including process and material handling upgrades. New 480V motor control centers and upgrade from single loop control to plant-wide DCS system. Project included production of entirely new drawing package for the plant electrical and instrumentation systems.

- PCS Phosphates, Phosphoric Acid Plant - Direct Blend, Aurora, NC. Engineer responsible for electrical and instrumentation systems associated with a land reclamation system. Project required additions to the existing plant PLC and 350HP Variable Frequency Drive (VFD).

- Kellogg Distribution Center, Tampa, FL. Produced electrical study for addition of a back-up power generator to the facility 1200Amp power distribution system.

- Saudi Arabian Phosphate Consortium, DAP and Beneficiation Plant, Saudi Arabia. Responsible for development of Motor Control Center (MCC) single line diagrams and +/- 10% cost estimate. MCCs include medium and low voltage with process control interface. Estimate required detailed take-off of materials required.

- US Agri-Chemicals, DAP Fertilizer Facility, Bartow, FL. Electrical and controls engineer on the design associated with an upgrade to the ball mills and the oversized and fines conveyors. Upgrade included replacement of the mills from a chain type to ball type, an increase in HP for the variable speed conveyors and addition of diverter gate. Controls and instrumentation included a scale and position meters in the control room.

- US Agri-Chemicals, MAP Fertilizer Loadout, Ft. Meade, FL. Electrical and controls engineer for the design associated with finishing/polishing screen and an upgrade to the conveyors associated with railcar loading facility. Upgrade included MCC modifications, lighting and grounding of the screen structure and conveyor controls.

- PCS Phosphates, Purified Phosphoric Acid Facility, Aurora, NC. Lead electrical engineer on the EPC project team responsible for the design, procurement and construction of an expansion to an existing purified phosphoric acid production facility. Recently completed total installed cost (TIC) estimate. Project includes 25kV power distribution, 4-2500kVA transformers, electrically hazardous areas, subcontract and equipment procurement, and construction support.

- Florida Power Corporation, Crystal River, FL, Lead electrical and controls engineer on the plant drain renovation project for units 4 & 5. The project included 3 pumping stations using soft starters and variable frequency drives. Controls involved capacitance type level switch with multiple set points and alarms for variable flow application.

- Petersen Industries, Lake Wales, FL. Electrical engineer for the design associated with the relocation of a 100,000 sq. ft. manufacturing facility. Required new electrical service, utility stations, lighting, grounding and electrical systems for paint booths.

- Resolution Performance Products (RPP), Lakeland, FL. Performed a survey of the power distribution system that will result in single line diagram validation, load study using Excell, inspection report and maintenance recommendations.

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- OCP, Safi, Morroco. Sulfuric Acid Scrubbing. Designed electrical systems associated with addition of a 2-train scrubbing system to their existing sulfuric acid production facility.

- Astaris Corporation, Purified Phosphoric Acid Facility, Soda Springs, ID. Lead Electrical Engineer responsible for electrical systems design and construction associated with a new phosphoric acid production facility. Responsibilities include project scope, estimate, equipment and subcontract procurement, management of engineering and design staff and construction support. Project required new utility substation (46kV-13.8kV), 4 secondary unit substations and modular power centers with MCCs, UPS and heat tracing systems. Motor control requirements include MV controllers, VFDs and DCS interface with local control. Project included hazardous areas, lighting, grounding and lightning protection.

- Tampa Electric Co., Polk Power Station, Mulberry, FL. Electrical Engineer responsible for design associated with the installation of a 1250HP compressor and entrainment separator (scrubber). Project required the installation of pumps, lube oil system, Bently-Nevada vibration monitoring. System was controlled with plant DCS and hardwired interlocks requiring instrument/control wiring and I/O assignment coordination with existing Bailey DCS. Responsible for maintaining engineering cost and schedule, writing specifications and checking detailed design.

- Merck & Co., Inc. Pharmaceutical Production Facility, Westpoint, PA. Electrical Engineer responsible for systems design associated with new wet milling, processing and encapsulation process. Project required the renovation of 3 areas within an existing production building, including Class 1, Division 2 hazardous areas. Process requires the addition of new 800A Motor Control Center (MCC) employing Variable Frequency Drives (VFDs) for the control of vessel agitators. System control will be through networked Programmable Logic Controllers (PLCs) requiring extensive instrument wiring.

- Eli Lilly, Packaging Facility, Indianapolis, IN. Electrical Engineer assigned to conceptual design team that generated design criteria narrative and +/-15% Total Installed Cost (TIC) estimate. Project will design 100,000 square foot pharmaceutical packaging facility on an existing Eli Lilly site. Facility includes 5 packaging lines, material staging/storage, administrative offices and QA/QC offices. Requires 3-800A feeders from existing substation serving two MCCs and one distribution panel. Design includes systems for Class 'A' clean fill areas.

- Schering-Plough, Pharmaceutical Production Facility, Mexico City, Mexico. Electrical Engineer responsible generating Basis of Design (BOD) and +/-15% TIC estimate for new sterile packaging facility in an existing production building. BOD required evaluation of existing normal and emergency power distribution scheme, preliminary equipment layout and electrical systems narrative. Emergency power generation required load analysis for adequacy of existing generator. Design requires systems for Class 'A', clean room areas with pre-manufactured wall and ceiling systems (Clestra) while complying with cGMP standards.

- Merck & Co., Inc. Pharmaceutical Production Facility, Westpoint, PA. Electrical Engineer. Served on study team that inspected and documented observations of three production buildings. Inspection covered compliance with governing codes and cGMP

issues. Developed binders that documented product, personnel and waste flow within the facility, general guidelines for compliance to industry codes and standards, and programming data sheets detailing our findings.

- Merck & Co., Inc. Pharmaceutical Production Facility, Westpoint, PA. Electrical Engineer. Produced construction documentation for modifications to a veterinary building. Scope included the relocation of a 400A distribution panel, installation of two new 400A feeders from two new distribution transformers and installation of new wet location lighting. Engineering required load analysis of existing facility to confirm new transformer loading and inspection of electrical installation for code compliance.

- Boehringer-Ingelheim Chemical, Inc., Bulk Production Facility, Petersburg, VA. Electrical Engineer. Generated conceptual design narrative for site-wide expansion of the facility infrastructure and production areas. Expansion includes new bulk production building with support wing, waste water treatment plant, lab and warehouse expansion, hazardous waste incinerator and administration building. Site development includes new redundant electrical service, distribution loop and emergency generators with peak shaving capability. Engineering required preliminary power distribution layout and load analysis to support conceptual cost estimate.

- NBC. Rockefeller Center Office Building and Studios, New York, New York. Electrical Engineer for two modification packages. Developed options for bypassing Con-Edison (utility) tie feeders within transformer vault networking rooms. Design of by-pass involved detailed survey of existing bus work and cable risers within network rooms and selection and design of power bus fittings, and splicing and cable support materials. Produced construction documents to install an additional parallel power feed for increased capacity of a switchboard main due to harmonic overload concerns.

- Merck & Co., Inc. Bulk Chemical Manufacturing Plant, Rahway, NJ. Lead Electrical Engineer. Responsibilities include budget and schedule management, specification writing, equipment selection, calculations and studies, and the design of power distribution, motor control, PLC (Modicon) interface, lighting, and grounding systems for hazardous areas. Systems design includes ABB 1500kVA double-ended substation fed with a medium voltage overhead line, Square D Motor Control Centers (MCCs) with Variable Frequency Drives (VFDs) and PLC interface, hazardous area lighting and instrumentation and controls. Services include development of projects from conceptual design through construction assistance and systems start-up.

- NBC. Rockefeller Center Office Building and Studios, New York, New York. Worked on a power distribution upgrade project. Tasks included distribution of power from utility service vaults through switchgear to floor circuit breaker panels. Analyzed existing loads for sizing of new GE switchgear requiring detailed field surveys of existing conditions. Provided layout of feeders in congested overhead spaces while considering minimal down time due to reconnection of loads to new switchgear.

- Kimberly Clark. Field Services, Owensboro, KY. Responsibilities included electrical engineering support of systems checkout prior to start-up of new paper towel plant. Tasks required data collection, control system tuning, and instrumentation calibration during water runs. Gained experience with Honeywell TDC operator interface, Modicon

PLC, GE AF-300 series drives, and Honeywell smart transmitters as applied to chemical additive systems.

- Westvaco. Activated Carbon Production Facility, Wyckliffe, KY. Responsible for the design of electrical systems associated with the facilities' office and maintenance buildings, plant utility systems (potable water, fire water, etc.), truck weigh scales, fiber optic data highway and voice systems. Provided construction documents including power and control plans, instrumentation loops, motor control elementaries, MCC layout and procurement, and lighting plans. Specified fiber optic and specialized cabling, Allen-Bradley MCCs, lighting, and instrumentation/control devices which required coordination with vendors.

- Union Camp Corporation. Design Engineering and Field Services, Savannah, GA. Produced construction documents that required field verification of existing plant systems for the installation of three sump pumps in a highly corrosive area and a mill wide addressable fire alarm system (Pyrotronics). Pump controls involved ultrasonic level sensing, AB 1336 Plus drives, and Bailey DCS interface. Drawings required tray layout, panel layout, device specification, cable scheduling.

- Owens Corning. Roofing Plant Field Services, Savannah, GA. Construction Manager for capital improvements and Field Engineer for maintenance projects and technical writing. Capital projects included replacement of asphalt holding tanks, new plant sewer system tie-in to municipal system, and burner management and control systems. Produced plant "Total Energy Lockout Procedures" requiring full working knowledge of plant processes and electrical distribution system. Sewer system utilized Flygt pumps with Foxboro flow meter and chart recorder controls. Asphalt burner management and preheater controls utilized Honeywell UDC controllers and Tru-line chart recorders.

- Bechtel Power Corporation, Gaithersburg, MD.
  Assigned to a variety of jobs in the power generation industry. Lead engineer on site during start-up of 2-300 MW combined cycle units at FPL's Martin County generating station. Primarily responsible for the coordination and start-up of controls between Bechtel engineered systems and General Electric engineered turbine/generator systems. Produced over 200 schematics using AutoCAD, which showed the complete functionality and connections between the turbine/generator equipment and the balance of plant controls using Bailey DCS. Drawings were used for installation of cabling, systems checkout, and start-up.

- Worked for the Special Projects group in the Chicago, IL office supporting 6 Commonwealth Edison nuclear power plants. Worked on several technical studies and modification projects including the functional review of over 1500 safety-related motor operated valves (MOVs) at the 6 sites. Tasks included review and update of equipment specifications and operating procedures, and production of construction packages for modifications to MOV power and control circuitry. Produced and maintained an equipment and calculation database for all the MOVs reflecting voltage drop calculations, thermal overload sizes, motor feeder sizes and valve motor torque requirements. Generated modification packages, which included equipment bills of material, motor power and control upgrades, regulatory compliance documentation, and start-up/testing procedures.

- Electrical engineer on design team supporting a major boiler overhaul of FPL's Cape Canaveral Unit No. 1. Responsible for modification packages affecting instrumentation and control systems for the boiler and turbine/generator control systems including upgrades to hydrogen detection system and Bentley-Nevada vibration detection system. Produced bills of material and contractor installation packages, developed operating and maintenance procedures and supported start-up.

Additional related experience includes:

- Project Manager and Electrical Engineer on industrial and institutional projects with Ralph Hahn and Associates in Orlando, FL. Offered prime consulting services to governmental clients and engineering services to architectural clients. Responsibilities ranged from construction budgeting through design to construction management and turnover. Worked with clients on project budgeting and scheduling, equipment specification and acquisition, and code compliance. Engineering services included construction document production with AutoCAD, engineering analysis and studies, lighting, raceway and equipment layout, fire protection and detection and HVAC controls. Projects included new chemistry labs at the University of Central Florida, modifications to Titusville High School, clean room facilities in Hanger 'P' at Cape Canaveral Air Force Base, and telecommunications upgrades to Nocatee Elementary School specifying Category 5 equipment.

- Electrical Engineer with Ralph Hahn and Associates, West Palm Beach, FL. Responsible for systems design on a variety of institutional and governmental projects. Projects included the construction of three new high schools in Palm Beach County. Systems involved power distribution, lighting conforming to state requirements, voice/data systems, fire protection conforming to NFPA codes and CCTV. Responsibilities include equipment specification, design engineering, construction management, cost estimating, and vendor coordination.

- Design engineer with Actech Architects and Engineers in Jacksonville, FL. Responsible for production of construction documents using AutoCAD software. Projects required layout and sizing of electrical power distribution equipment, generator, lighting and facility communication. Required conformance to NEC, NFPA and Life Safety Codes for modifications to the City of Jacksonville's Performing Arts Center and Coliseum. Modifications and Upgrades involved the addition of emergency lighting and consolidation of emergency loads at the Coliseum and Upgrades to the stage lighting dimmer racks and fire protection systems at the Performing Arts Center.

Name: **WILLIAM E. ZEIGLER**

Title: **Manager of Project Controls**

Education: B.S., 1971, Building Construction, University of Florida

Certification: Certified General Contractor, Florida

Affiliation: American Association of Cost Engineers

Mr. Zeigler has 36 years of experience, including 14 years with Jacobs, serving as the Manager of Project Controls. He has held positions in planning and scheduling, cost control, estimating, procurement, field supervision, and various construction trades, providing him with a unique depth of experience to draw from in establishing and maintaining project controls systems. He has extensive experience with computerized project controls, both in custom applications and leading software products. Mr. Zeigler's experience in estimating includes the development of all grades of estimates from factored estimates to detailed, control-grade estimates. His experience in cost control is extensive and includes superior aptitude in scope management and early cost trending for pro-active cost control. Mr. Zeigler's experience in planning and scheduling includes inter-active planning, development of detailed schedules, application and leveling of resources, establishment of tracking systems for determining physical progress, and design and implementation of various reporting systems.

Representative assignments include:

- Mosaic Industries Central Screening Station
- Cargill beneficiation capital projects
- IMC beneficiation capital projects
- OCP New DAP Expansion, Morocco
- FMC/ ASTARIS phosphoric acid plants
- IMC-Agrico Multifos expansion
- Pabco Gypsum Facility Expansion
- CF Industries belt filter expansion
- Shell Chemical resins expansions and upgrades
- U.S. Agri-Chemicals MAP plant and shipping facility
- LaRoche NA Upgrade & AN Prill Fattening expansion
- W.R. Grace beneficiation facility
- TA Minerals beneficiation facility
- Celanese cogeneration facility
- Texasgulf ammonia scrubbing modification

- U.S. Army remedial action environmental projects
- U.S. Army Corps of Engineers Hurricane Andrew recovery project
- AFCEE remedial action environmental projects
- IMC Fertilizer environmental containment project
- CNCCC DAP production facility
- CNCCC phosphoric acid production facility
- BP MTBE production facility
- Mobil methanol production facility
- IMC phosphoric acid facility
- IMC-Agrico phosphoric acid plant expansion
- Occidental Chemical phosphoric acid and port facilities
- CF Industries beneficiation facility
- Anchor Glass facility improvements
- The Ledger newspaper production facility
- Syntex pharmaceutical facility improvements
- Apache Nitrogen facility expansion
- Albright & Wilson laboratory facility expansion
- Albright & Wilson product improvement and turn-around
- Breed Industries production facility expansion
- Sterling Pulp Chemical sodium chlorate plant
- DOMTAR gypsum board production plant expansion.

Mr. Zeigler's procurement and material control experience involved numerous large industrial projects where his duties included budgeting, scheduling, supervising, coordinating and troubleshooting the procurement effort as a lead member of the project team.

Mr. Zeigler has experience on a number of commercial and large residential construction projects, where his duties included estimating, procurement, subcontract administration, office management, field supervision and project management.

Employment History:

Jacobs Engineering Group Inc. Manager of Planning and Scheduling	1993 to date
Phillips & Jordan, Inc. Cost Engineer	1992 - 1993

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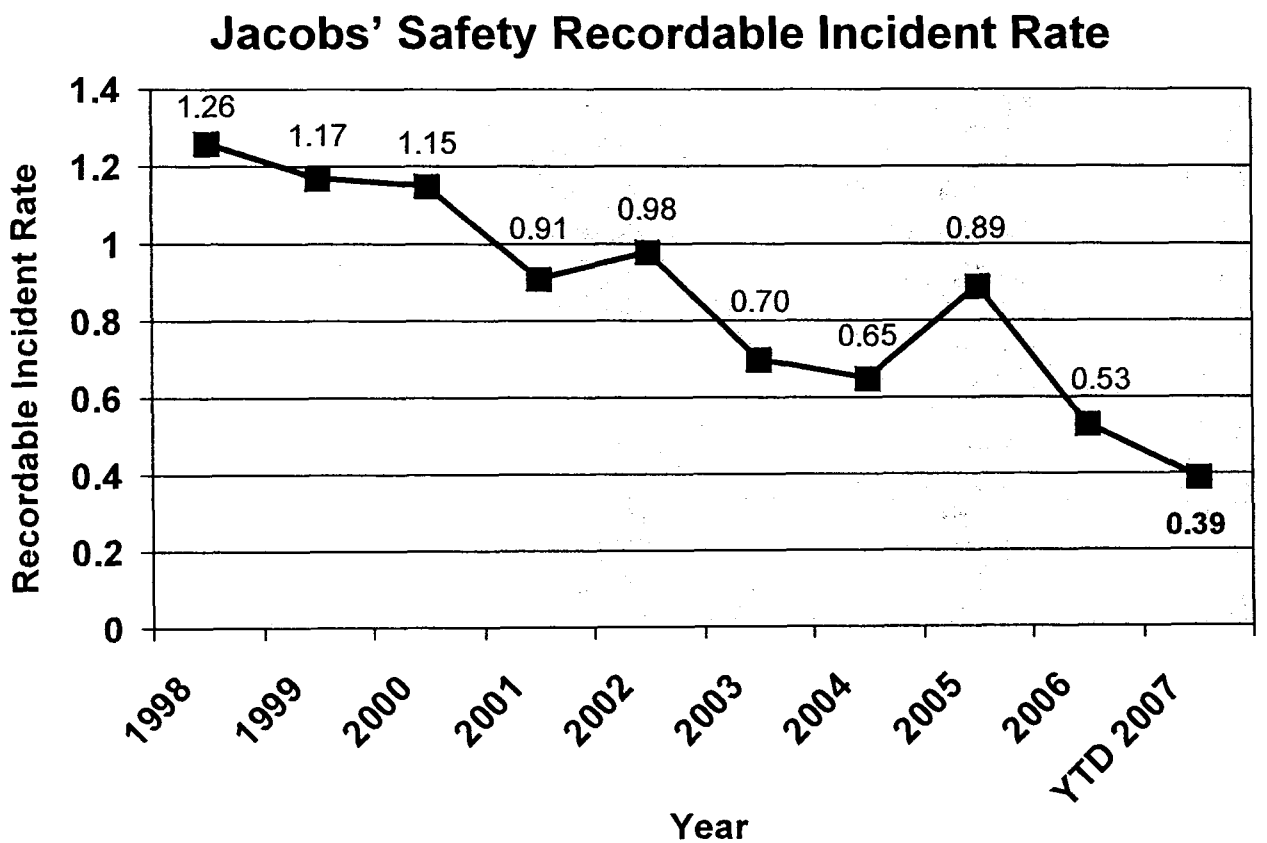
IMC	1990 – 1992
Cost Engineer/Project Planner	
Davy McKee Corporation	1974 – 1990
Cost Engineer/Project Planner/Estimator	1988 – 1990
Project Planner	1986 – 1988
Procurement Coordinator	1976 – 1986
Supervisor of Expediting	1974 – 1976
Imperial Construction Company	1973 – 1974
Project Manager	
Holton Construction Company	1971 – 1973
Estimator/Buyer/Contract Administrator/Office Manager	

Safety / HSE

Our Safety Record

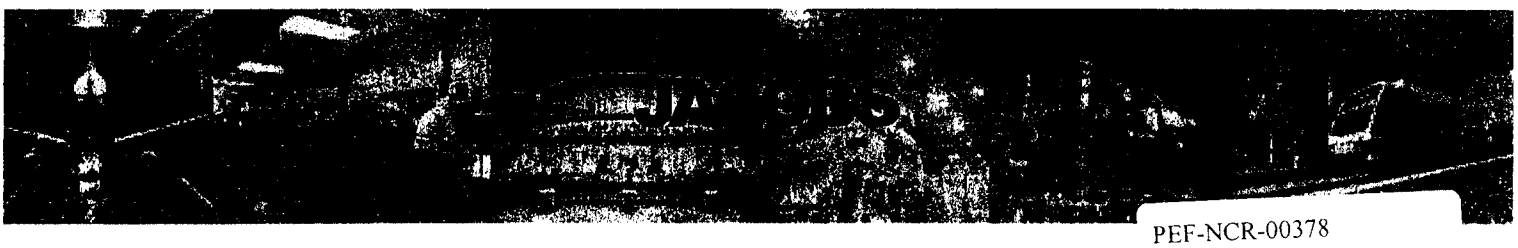


Our OSHA statistics for 2005 reflect the impact of a tragic explosion that occurred at the BP Texas City refinery on March 23, 2005. At the time of the explosion we had approximately 375 employees on site providing engineering and field services. Our employees were working in field offices and in a unit adjacent to the unit where the explosion occurred, doing work unrelated to the unit that exploded. This incident caused 15 fatalities, 11 of whom were Jacobs employees. 127 Jacobs employees had a OSHA Recordable injury, of which 100 involved Days Away from Work. The incident spurred an industry-wide movement to evaluate office locations for all personnel assigned in operating process units and to reexamine industry norms for safe separation distances between office locations and operating units. Jacobs is a leader in both areas.

These fundamental HSE Program elements **must** be followed:

- **DEMONSTRATE** management commitment by providing our people, contractors, clients, and the general public a safe and healthful work environment.
- **IMPLEMENT** the Jacobs HSE process and procedures.
- **SECURE** contract language that clearly defines Jacobs' HSE Roles and Responsibilities and **ENSURE** alignment with Jacobs' HSE objectives.
- **KNOW** the client's HSE requirements and expectations of Jacobs.
- **DEVELOP** a location-specific HSE plan including a **H**azard **A**ssessment **S**afety **A**ction **P**lan.
- **ENSURE** compliance of all subcontractor and consultant HSE Programs and Site-Specific HSE Plans prior to mobilization and during work.
- **ASSIGN** the appropriate number of experienced HSE resources.
- **PLAN** each task by developing a **S**afe **P**lan of **A**ction or equivalent.
- **CONDUCT** HSE orientation for all personnel.
- **PROVIDE** people the instruction and training to safely perform their work.
- **CONDUCT** HSE observations including **S**afety **O**bservation **R**eports or equivalent. Document findings and take corrective action.
- **MONITOR** compliance with company, client, and regulatory standards by conducting HSE audits such as **S**afety **E**valuation **R**eports and Safety Sampling.
- **MEASURE** HSE performance and track continuous improvement.
- **RECOGNIZE** superior HSE performance.
- **MAINTAIN** HSE records.
- **INVESTIGATE** <u>all</u> incidents to prevent recurrence.
- **PROMOTE** HSE both on and "off-the-job".

Strict adherence to these does not guarantee success; ignoring them almost guarantees failure.



The Jacobs HSE Manual is a company-proprietary document. In lieu of enclosing with this proposal the entire, large HSE Manual, we are providing the Manual's Table of Contents. The Table of Contents represents well over a thousand pages of comprehensive policies, procedures, and work instructions on a broad array of health, safety, and environment topics.

Health, Safety, and Environment Manual

Table of Contents

HSE Procedures Approval:
Susan.Kiesling@Jacobs.com

JNet HSE Content Manager:
David.Smith@Jacobs.com

Use ***Ctl F*** feature to search for key words in the Table of Contents.

by date means recently updated or new HSEP.

GLOBAL POLICIES AND PROCEDURES

DOCUMENT NUMBER AND NAME		DATE
	Global Company Policy	
GSOP350	HSE Program	15 Oct 06 <>
	HSE Absolutes	

WORK PROCESS MAPS

DOCUMENT NUMBER AND NAME		DATE
WPM-11	Project Health, Safety, and Environment	3 Sep 01

HEALTH, SAFETY AND ENVIRONMENT PROCEDURES (HSEPs)

DOCUMENT NUMBER AND NAME		DATE
1.0	**HEALTH, SAFETY, AND ENVIRONMENT PROGRAM**	
1.1	Reserved	
1.2	Project HSE Management	30 Jun 05
1.3	Chemical Hazard Communication	1 Oct 07
1.4	Office HSE Management	13 Apr 04
1.4f1	Office HSE Plan – Sample and Guidelines	13 Apr 04
1.4f2	Field Office HSE Checklist	13 Apr 04
1.4f3	HSE Survey Checklist for US Project Offices and Trailers	4 Oct 05
1.5	Health, Safety, and Environment Program Implementation Responsibilities	29 Jul 02
1.6	Field Site Mobilization HSE Requirements	20 Mar 06
1.7	Design Safety	25 Feb 04
1.8	HSE Awards Program	15 Oct 06
2.0	**GENERAL AND ADMINISTRATIVE**	
2.1	Zero Incident Process, Rescinded, Go to GSOP 350	
2.2	Safety Evaluation Reports (SERs)	22 Mar 04
2.2f1	Field SER Form	22 Mar 04
2.2f2	Office SER Form	22 Mar 04
2.3	Audits of Environmental Projects	27 Sep 02
2.4	Regulatory Inspections	4 Mar 04

DOCUMENT NUMBER AND NAME		DATE
2.4f1	Documents Requested	4 Mar 04
2.5	Competent Person Designation	1 Nov 02
2.6	Job Site Notices and Posting Requirements	1 Dec 02
2.7	Work Permits	3 May 02
2.8	Hazard Warnings	1 Jun 97
2.9	Subcontractor HSE	19 Aug 05
	Attachment A, HSE Requirements for US Contractors	17 Aug 07
	Jacobs Subcontractor Injury Performance Standard	19 Aug 05
	Applicant Contractor HSE Rating Worksheet	19 Aug 05
	Attachment A, HSE Requirements for Subcontractors in Canada	30 Mar 07
	Subcontractor Prequalification Evaluation Form For Canadian Operations	19 Aug 05
	Subcontractor Prequalification Evaluation Guidelines for Canadian Operations	19 Aug 05
	Contractor Risk Mitigation Plan For Canadian Operations	19 Aug 05
2.10	California Injury and Illness Prevention Program (IIPP)	1 Jun 97
2.11	Emergency Response Action Plan	15 Nov 03
2.11f1	Model Emergency Response Action Plan	15 Nov 03
2.11f2	Incident Notification	15 Nov 03
2.12	Hazard Assessment and Safety Action Plan (HASAP)	5 Dec 06
2.12f1	Outline and Guide for HASAP Development	5 Dec 06
2.12f2	Occupied Facility Location Review Checklist	5 Dec 06
2.13	Statistical HSE Performance Reporting has been rescinded and merged into HSEP 5.3	6 Jan 05
2.14	Modified Duty	2 Jun 04
2.15	Personnel Demobilization Planning	24 Aug 03
2.16	Safe Plan of Action (SPA)	17 Jul 06
2.16f1	Safe Plan of Action Form	17 Jul 06
2.16f2	SPA Assessment Form	17 Jul 06
2.16f3	Printer-Ready SPA Assessment Pocket Card In PDF Format	17 Jul 06
2.17	Safety Observation Reports (SOR)	17 Feb 04
2.18	Behavioral Safety Observation Report Process	6 May 05
2.22	Hazard Analysis	5 Dec 06
3.0	**TRAINING**	
3.1	Health & Safety Training	6 Dec 06
3.1f1	HSE Training Guidelines by Job Function Matrix	6 Dec 06
3.2	Health & Safety Training – Hazardous Waste Operations	1 Jun 97

DOCUMENT NUMBER AND NAME		DATE
4.0	**MEDICAL**	
4.1	Medical Monitoring Program For Environmental Project Work	28 Aug 01
4.2	Medical Monitoring & Training Tracking System	28 Aug 01
4.3	Reserved	
4.4	First Aid Program	10 Nov 06
5.0	**ACCIDENT AND INCIDENT REPORTING AND RECORD KEEPING**	
5.1	Accidents and Incidents	3 Jan 06
5.2	Vehicle Accidents	3 Jan 06
5.3	HSE Performance Metrics	19 Feb 07
6.0	**POTENTIALLY HAZARDOUS WORKPLACES**	
6.1	Abrasive Blasting Areas	17 Sep 03
6.2	Carpenter Shops	7 Oct 03
6.3	Insulation Shops	29 Sep 03
6.4	Mechanic Shops	21 Feb 05
6.5	Paint Yards	31 Mar 05
6.6	Pipe Shops and Pipe Fabrication	12 Jan 07
6.6f1	Jack Stand Inspection Form	12 Jan 07
6.6f2	Jack Stand Inspection Points	12 Jan 07
6.7	Shop and Storage Areas	29 Jul 05
6.8	Structural Iron Shops	29 Jul 05
6.9	Warehouse Safety	29 Jul 05
6.10	Rescinded	
7.0	**POTENTIALLY HAZARDOUS ENVIRONMENTS**	
7.1	Reserved	
7.2	Confined Space Entry	6 Apr 06
7.2f1	Confined Space Entry Assessment And Permit	10 Mar 06
7.3	Hazardous Materials Sites and Hazardous Waste Sites	9 Aug 01
7.3.1	Site Health, Safety, and Environment Plans	9 Aug 01
7.3.2	Site Control	13 Aug 01
7.3.3	Utility Clearance	21 Aug 06
7.3.4	Project Initiation	20 Aug 01
7.3.5	Materials Handling, Related to Hazardous Waste Activities	13 Aug 01
7.3.6	Drum Handling	14 Aug 01
7.3.7	Emergency Planning and Response	14 Aug 01
7.4	Working Safely Around Wild Animals	28 Aug 01
7.5	Locating and Removal of Screw Pickets	23 Dec 02
7.6	Working in Environments with Endless Belt Manlifts	7 Mar 07
8.0	**POTENTIALLY HAZARDOUS OPERATIONS AND ACTIVITIES**	
8.1	Concrete Work	14 Aug 01
8.2	Seal Plugs and Plumber's Plugs	14 Aug 01
8.3	Excavating Equipment Use and Operator Qualification	21 Sep 07
8.4	Excavations	29 Jul 05
8.5	Line and Equipment Opening	29 Jul 05
8.6	Material Handling and Storage	15 Sep 06
8.7	Underground Storage Tank Removal	29 Jul 05

DOCUMENT NUMBER AND NAME		DATE
8.8	Oxy-Fuel Cutting and Gas Welding and Electric Arc Welding	29 Jul 05
8.9	Drilling In VOC Contaminated Soil	29 Jul 05
8.10	Drill and Drill Rig Safety	29 Jul 05
8.11	Hot Taps and Welding on In-Service Equipment	6 Jan 05
8.12	Purging Natural Gas Fueled Equipment and Pipes	20 Apr 05
9.0	**POTENTIALLY HAZARDOUS SUBSTANCES**	
9.1	Asbestos Exposure Protection	30 Mar 04
9.2	Asbestos Avoidance	30 Mar 04
9.3	Hexavalent Chromium Exposure Protection - US Operations	23 May 06
9.3.1	Project-Specific Hexavalent Chromium Exposure Protection Program	23 May 06
9.4	Lead Exposure Protection	22 Feb 07
9.5	Unexploded Ordnance Clearance	18 Sept 01
9.6	Mold Prevention and Remediation	2 June 04
9.7	Hydrogen Sulfide	18 May 07
10.0	**RADIATION**	
10.1	Radiation Protection Program	26 Sept 01
10.2	Radiographic Work	13 Sept 01
10.3	Nuclear Density Gauges	4 May 04
11.0	**HAZARD CONTROL PROCEDURES**	
11.1	Biological Hazard Control	17 Sept 01
11.2	Bloodborne Pathogen Exposure Control	1 Feb 07
11.3	Chemical Warfare and Incendiary Agents	18 Sept 01
11.4	Cold Stress Control	18 Sept 01
11.5	Heat Stress Control	18 Sept 01
11.6	Occupational Noise	18 Sept 01
11.7	Spill Containment	29 Jul 05
11.8	Ergonomics	6 Oct 04
11.9	Decontamination	19 Sept 01
11.9.1	Level A Decontamination	24 Sept 01
11.9.2	Level B Decontamination	24 Sept 01
11.9.3	Level C Decontamination	24 Sept 01
11.9.4	Level D Decontamination	24 Sept 01
12.0	**INDUSTRIAL HYGIENE MONITORING AND SURVEILLANCE**	
12.1	Health Hazard Evaluation	1 Oct 07
12.2	Personal Air Monitoring	24 Mar 03
13.0	**PERSONAL PROTECTION PROGRAM**	
13.1	Personal Protective Equipment	29 Jul 01
13.2	PPE Program for Environmental Activities	28 Aug 01
13.3	Head Protection	12 Jan 07
13.4	Hand Protection	13 Sept 01
13.5	Foot Protection	29 Jun 01
13.6	Eye and Face Protection	10 Aug 01
13.7	Work Attire and Clothing	26 Aug 01
13.8	Fall Prevention and Protection	28 May 03

DOCUMENT NUMBER AND NAME		DATE
	Questions and Interpretations	6 Jun 03
13.9	Respiratory Protection Program	8 May 03
13.9f1	Site-Specific Respiratory Protection Program Model Form	8 May 03
14.0	**EMERGENCY & CONTINGENCY PLANNING**	
14.1	Emergency Evacuation	28 Aug 01
14.2	Earthquake	28 Jul 01
14.3	Hurricanes and Typhoons	29 Jul 01
14.4	Remote Site Emergency Preparedness	29 Jul 01
15.0	**PHYSICAL HAZARD PREVENTION PROCEDURES**	
15.1	Lock-out/Tag-out	22 Jul 02
15.2	Scaffolding	12 Apr 04
15.3	Work Over or Adjacent to Water	22 Oct 03
15.4	Offshore Work Locations	Under Construction
16.0	**MAINTENANCE AND STORAGE AREAS**	
16.1	Compressed Gas Cylinder Storage	18 Jul 01
16.2	Flammable and Combustible Liquids Storage	29 Jul 05
16.3	Fuel Storage	29 Jul 05
16.4	Housekeeping and Material Handling	29 Jul 05
16.5	Waste and Trash Receptacles	29 Jul 05
17.0	**HEAVY EQUIPMENT**	
17.1	Mobile Cranes	21 Sep 07
17.2	Mobile Crane Operator Certification	22 Jul 02
	Questions and Interpretations	15 Sep 03
17.3	Crane Suspended Personnel Baskets	4 Aug 05
17.4	Forklifts	29 Jul 05
17.5	Forklift Operator Qualifications	25 Jul 01
17.6	Rigging	5 May 04
17.7	Critical Lifts	7 Dec 05
17.8	Steel Erection and Dismantling	22 Mar 02
17.9	Aerial and Scissor Lift Use	31 Aug 06
17.10	Forklift Mounted Work Platforms	14 Mar 05
17.11	Overhead Cranes	3 Aug 04
18.0	**TOOLS AND SMALL EQUIPMENT**	
18.1	Chain Falls and Come-a-longs	30 Jul 01
18.2	Electrical Tools	22 Jul 02
18.3	Ladders and Stairways	6 May 03
18.4	Small Tools and Equipment	14 Aug 01
18.5	Pedestal, Bench, and Portable Grinders	30 Sep 04
18.6	Pneumatic Tools	28 Aug 01
18.7	Powder Activated Tools	28 Aug 01
19.0	**ELECTRICAL SAFETY**	
19.1	Electrical Safety	25 Sep 02
19.2	Assured Grounding (Electrical Inspections)	29 Jul 02
19.3	Qualified Electrician Program	15 Aug 01

DOCUMENT NUMBER AND NAME		DATE
19.4	Energized and Potentially Energized Electrical Equipment	25 May 07
20.0	**FIRE PREVENTION**	
20.1	Fire Prevention	15 Aug 01
20.2	General Fire Protection	16 Aug 01
20.3	Fire Extinguishers	28 Aug 01
21.0	**TRANSPORTATION**	
21.1	Transportation of Materials and Personnel	29 Jul 05
21.2	Motor Vehicle Safety	4 Mar 04
21.2f1	Blank Rental Vehicle SPA Form	4 Mar 04
21.2f2	Sample Completed Rental Vehicle SPA Form	4 Mar 04
21.2f3	Motor Vehicle SPA Pocket Card	11 May 07
21.3	Travel to Remote and Difficult Locations	16 Aug 01
21.4	Travel Safety	21 Jan 05
22.0	**ENVIRONMENTAL**	

QA / QC

The Jacobs Global Quality Manual is a company-proprietary document. In lieu of enclosing with this proposal the entire Global Quality Manual, we are providing the Manual's Table of Contents.

JACOBS

Global Quality Manual		Document No: N/A	Page:
		Supersedes: Rev 0	Revision: 1 Issue Date: 24-May-04
Issuing Department: Corporate Quality	Functional Manager: Margaret.Bell@Jacobs.com	Previous Rev. & Issue Date: Rev 0, 15-Nov-03	Effective Date: **24-May-04**

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1.2 OUR GLOBAL MANAGEMENT SYSTEM 2

2.0 SCOPE OF APPLICATION 2

3.0 DEFINITIONS 2

4.0 QUALITY AND HEALTH, SAFETY, AND ENVIRONMENT POLICY 2

5.0 GLOBAL QUALITY SYSTEM DOCUMENTS 3
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General Information

GENERAL INFORMATION

In the event that your Proposal is accepted and a Contract is awarded to the firm whose full legal company name appears herein below, Mr./~~Mrs.~~ James T. Stewart, whose title is Group Vice President, Eastern Region, will be executing the Contract on behalf of the firm. Should this person's title not indicate that he/she is a corporate officer (president, vice president, or corporate secretary), an affidavit signed by a corporate officer shall be provided along with the bid, stating that the person whose name appears above is duly authorized to execute contracts on behalf of the firm.

The Contractor is: (select appropriate line and complete information)

An Individual: _____

A Corporation of the State of: Delaware

A Partnership consisting of: _____

A Joint Venture comprised of: _____

Full Legal Company Name Jacobs Engineering Group Inc.

Business Address 1041 East Butler Road
Greenville, SC 29607

Mailing Address (if different) P. O. Box 5456
Greenville, SC 29606-5456

Contact Name Steve Hazle

Contact Phone 864-676-6179

Contact E-Mail steve.hazle@jacobs.com

Company Website www.Jacobs.com

Federal Tax ID Number 95-4081636

Contractor's License Number (if applicable) _____ State of Issuance _____

In accordance with the Federal Acquisition Regulation section 52.219, please check all that apply to your company. Please provide supporting documentation or certification to confirm the status for any categories checked under Small/Diverse Vendors.

[ ] Certified small business*
[ ] Veteran-owned business*
[ ] Service-disabled veteran-owned business*
[ ] Not a Small Business
[ ] HUBZone, 8(a) or disadvantaged business*
[ ] Minority-owned business * *
[ ] Women-owned small business * *

* As defined by the Small Business Administration (SBA): www.sba.gov
* * Certified by Progress Energy and as defined by SBA.

Register online at www.progress-energy.com/supplierdiversity

BY: _____

NAME (printed): Steve Hazle

TITLE: Manager, Business Development

DATE: October 5, 2007

10/08/07
3:06PM

MPR ASSOCIATES INC. PRICED
ENGINEERS

September 28, 2007

Ms. Deborah Hanna
Progress Energy Florida, Inc.
15760 W. Powerline Street (SA2C)
Crystal River, FL 34428-6708

Subject: Proposal Response to Request No. DH07-003, "Crystal River Discharge Canal Cooling Study"

Dear Ms. Hanna:

MPR is pleased to submit one priced and one unpriced proposal in response to the subject request issued by Progress Energy Florida on August 27, 2007. Also enclosed are two copies of our Quality Assurance Manual as requested in the bid requirements.

We believe that we are uniquely qualified to successfully perform this study for Progress Energy as demonstrated by our 40+ years of providing innovative solutions to some of the most challenging problems that our power industry clients have faced. MPR is recognized as a specialty engineering firm that offers unique solutions to challenging problems. We approach each new problem from a "first principles" perspective and use an open, collaborative peer review process to ensure that possible solutions to a given problem are identified and thoroughly vetted. We encourage out-of-the box thinking while sharing the "real-world" perspective of a power plant owner and operator.

MPR has performed extensive work at the Crystal River Energy Complex over the past 25+ years for both the nuclear and fossil units. As part of this work, MPR participated in the Crystal River Extended Power Uprate (EPU) Design Review meeting held in Charlotte this past May. Our participation in that meeting provided us with a good understanding of the challenges facing the EPU project and the criticality of this discharge canal cooling study to the success of the overall project. We are excited at the opportunity to continue to support Progress Energy on this important project. Please contact me at (703) 519-0200 if you have any questions related to this proposal or our company in general.

Sincerely,

Kevin Myers

Kevin Myers, P.E.

Enclosures

320 KING STREET ALEXANDRIA, VA 22314-3230 703-519-0200 FAX: 703-519-0224 http://www.mpr.com

10/08/07
3:00PM

WorleyParsons

resources & energy

2675 Morgantown Road
Reading, Pennsylvania 19607
USA
Telephone: 610-855-2000
Facsimile: 610-855-2001
www.worleyparsons.com

October 3, 2007

Deborah Hanna
Progress Energy Florida, Inc.
15760 W. Powerline Street
Crystal River, Florida 34428-6708

RE: CRYSTAL RIVER DISCHARGE CANAL COOLING STUDY
WORLEYPARSONS PROPOSAL NO. 0907R2022

Dear Ms. Hanna:

WorleyParsons is pleased to submit one priced copy and one unpriced copy of our proposal for the Crystal River Discharge Canal Cooling Study. This proposal responds directly to your request for proposal (RFP No. DH07-003). With over 100 years of tradition in our Power-based heritage companies of Chas. T. Main, Gilbert/Commonwealth, Parsons E&C, and now WorleyParsons, we bring this depth of experience and expertise to your project and will continue to build on the historical success of current and past projects.

WorleyParsons is one of the world's largest engineering and project delivery firms, servicing the global resource, energy, and infrastructure markets. With over 23,800 personnel in 84 offices in 32 countries around the globe, WorleyParsons has the technical expertise, project delivery systems, and resource depth to provide a comprehensive range of solutions to our clients. When experience counts, WorleyParsons has the track record and expertise that customers trust. WorleyParsons focuses on safe and successful project delivery in the following industry sectors: Power, Hydrocarbons (upstream and downstream), Minerals and Metals, and Infrastructure.

WorleyParsons provides engineering, procurement, construction management, program management, consultancy, and operations and maintenance services to clients in these sectors. Our solutions are customized to address regional, client, and project-specific requirements.

The WorleyParsons team brings distinct advantages over the competition in our commitment to safety, team performance, long-term client relations, focus on project delivery, corporate experience, depth of personnel experience, and location. WorleyParsons is committed to successful project delivery for both large and small projects. We have managed projects as large as $3 billion, as well as engineering services on a per task/man-hour basis. We value both extremes of our business portfolio for balance and customer diversification.

WorleyParsons

resources & energy

We look forward to your review of the information included in this submittal. If you have any questions, please contact our proposed project manager, David Trudel, at 610-855-2376. We are eager to participate and support the Progress Energy Florida on your planned study. Thank you again for the opportunity to submit our proposal.

Very truly yours,
WorleyParsons Group, Inc.

Steven B. Davis
Vice President

PEF-NCR-00394

WorleyParsons
resources & energy

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Section 3 – Cooling Tower and Water Discharge Systems Experience	3
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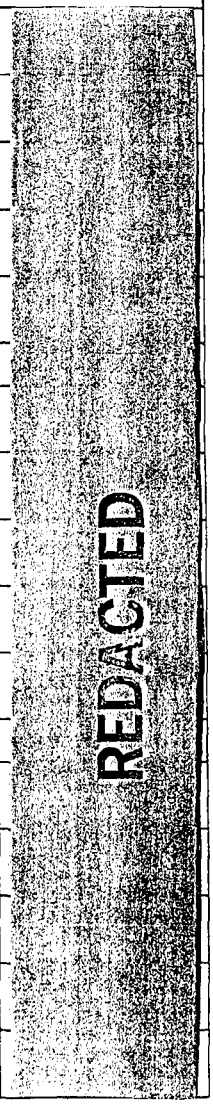
Section 5 – Clarifications and Exceptions	5

Section 4 Pricing

Item	Scope	Estimated Cost
Phase 1	Alternates Study	
	▸ Labor	
	▸ ODC	
	▸ Travel	
	▸ Fee	
	▸ **Total**	
Phase 1 Option	Use of Unit 4 & 5 Tower	
	▸ Labor	
	▸ ODC	
	▸ Travel	
	▸ Fee	
	▸ **Total**	
Phase 1	Conceptual Design	
	▸ Labor	
	▸ ODC	
	▸ Travel	
	▸ Fee	
	▸ **Total**	



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10/08/07
3:02 PM
JD.

Priced Version

PROPOSAL FOR
CRYSTAL RIVER DISCHARGE CANAL COOLING STUDY

Request for Proposal (RFP) – DH07-003

Deborah Hanna
Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Powerline Street (SA2C)
Crystal River, FL 34428-6708

Submitted by:

Enercon Services, Inc.
500 TownPark Lane
Kennesaw, GA 30144
770-919-1930

October 5th, 2007

ENERCON Proposal Number: PECR-07-3011

Contractor's License Number (if applicable) _____ State of Issuance ____

In accordance with the Federal Acquisition Regulation section 52.219, please check all that apply to your company. Please provide supporting documentation or certification to confirm the status for any categories checked under Small/Diverse Vendors.

[ ] Certified small business* [ ] HUBZone, 8(a) or disadvantaged business*
[ ] Veteran-owned business* [ ] Minority-owned business * *
[ ] Service-disabled veteran-owned business* [ ] Women-owned small business * *
[X] Not a Small Business

* As defined by the Small Business Administration (SBA): www.sba.gov
* * Certified by Progress Energy and as defined by SBA.

Register online at www.progress-energy.com/supplierdiversity

BY: _____

NAME (printed): JIM GANNON

TITLE: CLIENT SERVICES MANAGER

DATE: OCTOBER 4TH, 2007

6.0 Commercial Proposal

6.1 Cost and Commercial Terms

ENERCON will perform the work described as specified in this proposal on a time and material basis not to exceed the following amounts without prior written authorization:

PHASE I Alternatives Analysis - [redacted]
PHASE II Conceptual Design - REDACTED

All work will be performed in accordance with the time and materials rates, terms and conditions of our existing Master Services Agreement with Progress Energy. This proposal is valid for 30 days.

6.2 Resource Allocation

The following provides anticipated resource requirements for each phase of the project.

Labor Category	Phase I Hours	Phase II Hours
Project Manager		
Principle Civil / Structural Engineer		
Senior Civil / Structural Engineer		
Civil Structural Engineer I		
Principle Electrical Engineer		
Senior Electrical Engineer		
Electrical Engineer		
Electrical Engineer I		
Principle Mechanical Engineer		
Senior Mechanical Engineer		
Mechanical Engineer I		
Designer		
Drafter		
Administrative Assistant		
Scheduling Specialist		
TOTAL RESOURCE ALLOCATION	REDACTED	REDACTED

6.3 Assumptions and Clarifications

The following assumptions were used in developing the stated price:

1. Five copies of the draft report will be provided to Progress Energy for review and comment.
2. Progress Energy will provide one (1) consolidated set of comments to the draft report within 5 working days of submittal.
3. As this is a study, not providing engineering output or effecting changes to plant configuration, this project will not fall under the requirements of the Enercon's Quality Assurance program.
4. To expedite completion of this project, Progress Energy shall provide point-of-contacts within the Crystal River 3 site organizations to provide input and facilitate document retrieval.
5. No allowance is made for the services of a subcontractor such as SPX Cooling Technologies (formerly Marley Cooling Technologies). The need for these services is not currently apparent for this work scope, but would require additional funding if desired or required.
6. Enercon work scope is limited to that as described in this proposal.

6.4 Exceptions

1. ENERCON has provided an alternative schedule to that requested in the RFP. Milestone dates are provided in Section 4.0 Schedule.
2. ENERCON has provided an alternative approach to the Alternatives Analysis Process that involves performing a "Fatal Flaw" analysis intended to identify options that have particular issues which may significantly limit reasonable technical, operational, or financial feasibility. In turn, the analysis performed for each option may not include the entire suite of considerations outlined in the RFP.

Cope, Sandra C

From: Trudel, David T. (Reading) [David.Trudel@WorleyParsons.com]
Sent: Wednesday, October 24, 2007 1:25 PM
To: Hickman, Mark
Cc: Hanna, Deborah A; Davis, Steven B. (Reading)
Subject: RE: Crystal River Additional Discharge Canal Cooling Capacity Study RFP Clarifications

Attached are our responses to your request in the spreadsheet.

Except for a misunderstanding for the Recirculation Line, we took into account all other items in the spreadsheet. It is difficult however to address every line in the spreadsheet. I have broken them into groups and assigned manhours accordingly.

Please refer to our notes on your spreadsheet and on the worksheet named WP Notes.

Our new estimated price for Phase I is

Our estimates for the Option and for Phase II has not changed

We do not believe that this will affect our completion schedule beyond the delay in awarding the project.

I hope this provides the information you desire to complete your evaluation.

From: Hickman, Mark [mailto:Mark.Hickman@pgnmail.com]
Sent: Monday, October 22, 2007 4:43 PM
To: Trudel, David T. (Reading)
Cc: Hanna, Deborah A
Subject: Crystal River Additional Discharge Canal Cooling Capacity Study RFP Clarifications

Mr. Trudel,
After reviewing your bid for the subject RFP we feel that you may need some additional information to ensure that we have a common understanding of the RFP requirements. I've attached a spreadsheet to provide that information and get some additional information from you that will allow us to make a final selection from the bids we received. Because we were not able to make the award as previously planned the Study Phase completion date will move out appropriately. When you reply to this request please confirm that the people submitted to work on this project are still available. If different people will be working on the project please identify who would be working on the project.

Sincerely,
Mark Hickman
Progress Energy
Additional Discharge Canal Cooling Capacity Project Manager
352-795-6486 x4233

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<<Requirements Matrix.xls>>

*** WORLEYPARSONS GROUP NOTICE ***
"This email is confidential. If you are not the intended recipient, you must not di

Requirements Matrix

The below list itemizes the minimum expected Contractor activities as estimated by PEF. The list is being provided to ensure the potential Contractors understand the work being requested via the Additional Discharge Canal Cooling Capacity RFP. Please verify that the activities have been accounted for in your bid and state the type of resource(s) and amount of time estimated for the listed activities. If your bid did not include the work listed, please update your bid and resubmit by **COB Thursday, October 25, 2007**. The proposed schedule previously provided with your bid should be updated as well.

Requirement	Resource(s) Assigned	Time Allocated per Resource	WP Notes (See next sheet)
Mobilize Contractor for Study	PM	18	1
Travel round trips to the Contractor's facility.	ME	40	
Expenses while on travel			
Contractor Supervision needed during mobilization.			
Office supplies and misc cost during mobilization.			
General			2
Develop list of alternatives for analysis and obtain PEF approval to start analysis of selected options	ME	0	
Note: The minimum list of alternatives is stated in RFP.			
Office supplies and misc cost during alternatives analysis			
Obtain historical information.			
PEF will identify and assist in obtaining the information.			
The Contractor will identify his needs and review the documents.			
Walkdowns - approx. 2/week for 4 weeks.			
The Contractor is responsible to complete the necessary number of walkdowns.			
PEF will assist as necessary.			
Meetings - weekly status			3
The Contractor is responsible to set up, conduct, take notes, and distribute meeting minutes.	PM	16	
	ME	8	
Project personnel will attend the meetings and provide information, management, and project coordination as necessary.			

Recirculation Decision			
The Contractor will analyze the related information and identify how to recirculate Discharge Canal water to the Intake Canal. Recirculation flow and controls must allow for varying flow and cooling prior to returning the water to the Intake Canal. Some of the water will be returned to the Discharge Canal.	ME	45	4
	CSE	18	
	CE	27	
The Contractor will work with PEF to identify the location of the return flow to both the Intake Canal and the Discharge Canal. The Contractor will also identify how the flows will be discharged into the applicable canal.			
The Contractor will develop the control scheme and method for recirculation, develop equipment specs, develop layout drawings, and assist in resolving potential interference problems.			
PEF will work with the Contractor to identify the best decision. Obtain / review EPU & historical information. PEF will assist in locating site related data.			
PEF will provide minimum recirculation flow. The Contractor will analyze the cooling effect (of the recommended alternative) during each month of the year and identify the cooling effects on plant operation. The Contractor will then use this information to identify the optimal flows for plant operation and protection of the local biota. This will ensure the best alternative			
The Contractor will identify how the recirculation flow resolves the Intake Canal biota impingement issue. This resolution is expected to be in how the recirculated water is returned & discharged into the Intake Canal. If the recirculation flow does not resolve the issue, the Contractor is responsible to identify other mitigating controls that would be implemented to resolve the impingement issue.			
The Contractor will identify how the recirculation flow resolves the Intake Canal biota entrainment issue. This resolution is expected to be in amount of recirculated water is continually returned to the Intake Canal. If the recirculation flow does not resolve the biota entrainment issue, the Contractor is responsible to identify other mitigating controls that would be implemented to resolve the issue.			

Modular Cooling Tower Resolution -		
The Contractor will analyze the related Crystal River information and develop a cost benefit analysis that identifies if it is desirable to re-lease or replace the Modular Cooling Towers. Part of this analysis will include a fuel use benefit analysis The Contractor will work with PEF personnel to make the best decision. The cooling tower vendor is responsible to remove the equipment and restore the area within 30 days of contract completion.	ME	27
	EE	9
Walkdown areas - 4 times		
MCT cost benefit analysis		
Identify future electrical use and needed modifications.		
Mechanical demolition and removal is to be done by CT supplier.		
Identify future site restoration requirements to support new installation.		
If site reused		
If site not reused		
The removal of the Modular Cooling Towers must be coordinated with summer use requirements. Special sequencing must be identified in the schedule.		
Helper Cooling Tower resolution - validate & update Bechtel study, complete cost benefit analysis in conjunction with modular cooling towers.		
	ME	27
The Contractor will analyze the related information and discuss it with PEF to make a decision.		
Validate EPU heat added.		
Walkdown areas, estimated at 4 times		
Determine drift elimination requirements and determine testing methods (if applicable).		
Validate and update Bechtel study (fan use, height adjustment, drift elimination adjustment).		
Cost benefit analysis incorporating modular cooling tower decision.		
The upgrade of the Helper Cooling Towers must be coordinated with summer use requirements. Special sequencing must be identified in the schedule.		

Alternative Selection		
The Contractor will develop a list of potentially viable alternatives that should be included in the alternatives analysis. The Contractor will provide a reason each alternative should be included in the analysis. The Contractor will then work with PEF personnel to determine the alternatives to be included in the analysis.	ME	135
	EE	9
	CSE	4
	CE	16
	SE	9
The Contractor will analyze the information related to the recirculation flow & temperature requirements, the decision on Modular Cooling Tower removal, the Helper Cooling Tower upgrades (if applicable), and the additional heat mitigation requirements to determine the best alternative or combination of alternatives. The contractor will work with PEF personnel in making this decision.	PM	18
	Cost Est	100
The Contractor will also identify a proposed installation location and provide the reason for the location. Considerations in selecting the location will include site preparation and mitigations costs, constructability, and impact/interference with other CR operations.		
All the formal Contractor considerations and analysis must be documented and provided to PEF Project Manager.		
The Contractor will complete the following as part of this evaluation:		
Walkdowns of the areas.		
Determining drift elimination requirements and testing methods (if		
Develop a list of locations considered and associated advantages and disadvantages.		
Identify needed soil evaluations		
Complete buried utilities review		
Identify environmental concerns, permit requirements, and feasible mitigations.		
Develop alternatives selection report		
Develop Alternatives Analysis presentation.		
Complete Alternatives Analysis presentation at CR.		

Complete Conceptual Design			
The Contractor will complete a detailed scope description that identifies boundaries and interfaces with existing systems (site electrical, plant water, control room communications and distributed control system to name a few).	DC		7
Identify design parameters. Identify applicable codes and standards.	DC		
Identify equipment locations for installation and reasons for selection. These are proposed locations that will need to be validated during the final design. However, adequate investigation and testing needs to be done to have a high level of confidence the location will not change substantially. Activities to accomplish this task are supported by and include:			
The Contractor will size equipment for operation and necessary maintenance while maintaining necessary recirculation flow.	DC		
The Contractor will obtain, review, and markup electrical single line drawings and cable runs for all equipment. New drawings will be developed as required to identify the new and modified electric equipment in support of a final design.	sd		
The Contractor will obtain, review, and markup P&ID drawings for all affected systems. New drawings will be developed as required to identify the new and modified equipment in support of a final design.	SD		
The Contractor will obtain, review, and markup Piping drawings for all affected systems. New drawings will be developed were necessary to adequately support a firm fixed price contract for design of the new or modified system.	SD		
The Contractor will obtain, review, and markup loop and control drawings for all affected systems. New drawings will be developed were necessary to adequately support a firm fixed price contract for design of the new or modified system.	SD		
The Contractor will identify soils testing needed for selected installation location. The Contractor will identify the requirements, develop the technical specifications, and PEF will develop & coordinate the contract to obtain the soils information.	DC		
The Contractor will identify under ground utilities location requirements. Contractor will identify the requirements and PEF will develop & coordinate the contract.	SD		
The Contractor will identify installation requirements that are unique to the proposed design, installation, and/or startup of the equipment. This includes			

specific direction if field routing is not acceptable.		
The Contractor will state any assumptions made during the alternative selection in the alternatives analysis.	RP	
The Contractor will state environmental conditions anticipated during storage, construction, and operation.	DC	
The Contractor will identify environmentally sensitive areas near the construction areas. Identify the environmental permitting requirements for	DC	
The Contractor will identify any interface requirements including definition of the functional and physical interfaces involving structures, systems and	DC	
The Contractor will identify any precautions or limitations that need to be considered in completing the design.		
The Contractor will identify environmental considerations (e.g., maximum particulate carry over during evaporative processes).	DC	
The Contractor will provide installation sketches and marked up drawings for electrical, I&C, and mechanical systems. Develop P&ID of recommended system(s).	SD	
The Contractor will provide installation sketches and marked up drawings with civil/structural details.	SD	
The Contractor will size the equipment and provide calculations developed during the alternative evaluation and selection process.	ME	20
The Contractor will provide suggested component and equipment selection and procurement specifications for long lead items.		
The Contractor will identify the performance requirements of the selected alternative systems and equipment, such as capacity, rating, and system output.	DC	
The Contractor will identify material requirements such as electrical insulation properties, protective coating and corrosion resistance.	DC	
The Contractor will state mechanical requirements such as vibration, stress, shock, and reaction forces.	DC	
The Contractor will identify Structural requirements covering items such as equipment foundations and pipe supports.	DC	
The Contractor will identify hydraulic requirements such as pump net positive suction heads, allowable pressure drops, and allowable fluid velocities.	DC	
The Contractor will identify electrical requirements such as source of power, voltage, conduit requirements, electrical insulation and motor requirements. Provide the electrical power supply for each component and calculation of	DC SD	

the total electrical power required for the project.		

The Contractor will state the on-site electrical power source that will be used to supply the project. List the major pieces of electrical equipment to be procured and installed in order to provide electrical power to the major electrical components.	DC	
	SD	
The Contractor will identify of the electrical power routing from the main distribution switchgear to transformer(s) and load center(s) to be used for the project.	SD	
The Contractor will provide layout and general arrangement requirements and drawings.	SD	
The Contractor will identify additional requirements such as inadvertent activation prevention devices, such as switch covers, key lock switches and other human factors considerations (i.e. handwheel locks) PEF personnel will assist.	RP	
	DC	
The Contractor will identify operational requirements and sequencing under various conditions, such as plant start-up, normal plant operation, plant shutdown, plant emergency operation, special or infrequent operation, and system abnormal or emergency operation, including postulated accident conditions. PEF personnel will assist in determining these criteria. Contractor will add the requirements into the design documents.	RP	
The Contractor will state instrumentation and control requirements, including indicating instruments, controls, and alarms for operation, testing, and maintenance. Other requirements such as the type of instrument, installed spares, range of measurement, and location of indication should also be included. PEF personnel will identify desired instrumentation and alarms. The instrumentation and controls should be similar to existing equipment monitoring and control schemes. The existing DCS should be used if economical or a new system may be proposed. Contractor will evaluate the DCS, PEF will provide DCS design information to the Contractor.	DC	
The Contractor will state access and administrative control requirements for plant security. PEF personnel will help to identify, Contractor to include in design requirements.	DC	
If applicable, the Contractor will state redundancy, diversity and separation requirements of structures, systems, and components.	DC	
Identify the failure effects on the requirements of structures, systems, and components, including a definition of those events and accidents that they must be designed to withstand (i.e. hurricane winds). PEF will provide operational requirements and the Contractor will establish the design requirements.	DC	

The Contractor will identify system and component test requirements and the conditions under which they will be performed. Testing is to include operational demonstration of Air Permit requirements as well as component and system level testing (i.e. Megger test, continuity test, hydrostatic pressure test, pump performance test, & flow verifications). PEF will interface with FDEP to determine the acceptable emission testing.	DC	
The Contractor will state cleanliness requirements, installation inspections, and flushing requirements.	DC	
The Contractor will state component and system testing requirements.	RP	
The Contractor will identify accessibility, maintenance, repair, and in-service inspection requirements for the equipment, including the conditions under which these will be performed (PEF personnel to assist).	DC	
The Contractor will identify the on-site transportability requirements such as size and shipping weight, limitations.	DC	
The Contractor will identify the fire protection or resistance requirements. PEF will concur with these requirements prior to acceptance.	DC	
The Contractor will state that the design is to identify the handling, storage, and shipping requirements of procured material. PEF will identify how the Construction contractor will interface with the CR material receiving and storage group and provide that information to the Contractor for incorporation into the design requirements.	DC	
The Contractor will identify safety requirements for preventing personnel injury including such items as restricting the use of dangerous materials, escape provisions from enclosures, and grounding of electrical systems. Identify plant procedures that address these hazards (i.e. Chemical Control). PEF personnel will assist in identifying site requirements and procedures.	DC	
The Contractor will provide an Affected Documents List of site drawings and	ALL	36
The Contractor will provide an estimate of new drawings that will be generated during the detailed design phase.	RP	
The Contractor will prepare a Conceptual Design Report Package. Along with other design information, the conceptual design will include a design and construction schedule as well as a cost estimate for the design and construction efforts.	RP	
The Contractor will prepare a Conceptual Design Review Presentation.	ME/PM	36
The Contractor will complete the Conceptual Design Review Presentation at		
The Contractor will incorporate comments into the final design package and provide 5 copies (5 - electronic and 5 - hard copies) of the conceptual design package.	RP	

Cope, Sandra C

From: Hickman, Mark
Sent: Monday, October 22, 2007 4:43 PM
To: 'david.trudel@worleyparsons.com'
Cc: Hanna, Deborah A
Subject: Crystal River Additional Discharge Canal Cooling Capacity Study RFP Clarifications

Mr. Trudel,
After reviewing your bid for the subject RFP we feel that you may need some additional information to ensure that we have a common understanding of the RFP requirements. I've attached a spreadsheet to provide that information and get some additional information from you that will allow us to make a final selection from the bids we received. Because we were not able to make the award as previously planned the Study Phase completion date will move out appropriately. When you reply to this request please confirm that the people submitted to work on this project are still available. If different people will be working on the project please identify who would be working on the project.
Sincerely,
Mark Hickman
Progress Energy
Additional Discharge Canal Cooling Capacity Project Manager
352-795-6486 x4233

Requirements Matrix.xls (65 KB...

PEF-NCR-00412

Requirements Matrix

The below list itemizes the minimum expected Contractor activities as estimated by PEF. The list is being provided to ensure the potential Contractors understand the work being requested via the Additional Discharge Canal Cooling Capacity RFP. Please verify that the activities have been accounted for in your bid and state the type of resource(s) and amount of time estimated for the listed activities. If your bid did not include the work listed, please update your bid and resubmit by **COB Thursday, October 25, 2007**. The proposed schedule previously provided with your bid should be updated as well.

Requirement	Resource(s) Assigned	Time Allocated per Resource
Mobilize Contractor for Study		
Travel round trips to the Contractor's facility.		
Expenses while on travel		
Contractor Supervision needed during mobilization.		
Office supplies and misc cost during mobilization.		
General		
Develop list of alternatives for analysis and obtain PEF approval to start analysis of selected options		
Note: The minimum list of alternatives is stated in RFP.		
Office supplies and misc cost during alternatives analysis		
Obtain historical information.		
PEF will identify and assist in obtaining the information.		
The Contractor will identify his needs and review the documents.		
Walkdowns - approx. 2/week for 4 weeks.		
The Contractor is responsible to complete the necessary number of walkdowns.		
PEF will assist as necessary.		
Meetings - weekly status		
The Contractor is responsible to set up, conduct, take notes, and distribute meeting minutes.		
Project personnel will attend the meetings and provide information, management, and project coordination as necessary.		

Recirculation Decision		
The Contractor will analyze the related information and identify how to recirculate Discharge Canal water to the Intake Canal. Recirculation flow and controls must allow for varying flow and cooling prior to returning the water to the Intake Canal. Some of the water will be returned to the Discharge Canal.		
The Contractor will work with PEF to identify the location of the return flow to both the Intake Canal and the Discharge Canal. The Contractor will also identify how the flows will be discharged into the applicable canal.		
The Contractor will develop the control scheme and method for recirculation, develop equipment specs, develop layout drawings, and assist in resolving potential interference problems.		
PEF will work with the Contractor to identify the best decision. Obtain / review EPU & historical information. PEF will assist in locating site related data.		
PEF will provide minimum recirculation flow. The Contractor will analyze the cooling effect (of the recommended alternative) during each month of the year and identify the cooling effects on plant operation. The Contractor will then use this information to identify the optimal flows for plant operation and protection of the local biota. This will ensure the best alternative		
The Contractor will identify how the recirculation flow resolves the Intake Canal biota impingement issue. This resolution is expected to be in how the recirculated water is returned & discharged into the Intake Canal. If the recirculation flow does not resolve the issue, the Contractor is responsible to identify other mitigating controls that would be implemented to resolve the impingement issue.		
The Contractor will identify how the recirculation flow resolves the Intake Canal biota entrainment issue. This resolution is expected to be in amount of recirculated water is continually returned to the Intake Canal. If the recirculation flow does not resolve the biota entrainment issue, the Contractor is responsible to identify other mitigating controls that would be implemented to resolve the issue.		

Modular Cooling Tower Resolution -		
The Contractor will analyze the related Crystal River information and develop a cost benefit analysis that identifies if it is desirable to re-lease or replace the Modular Cooling Towers. Part of this analysis will include a fuel use benefit analysis The Contractor will work with PEF personnel to make the best decision. The cooling tower vendor is responsible to remove the equipment and restore the area within 30 days of contract completion.		
Walkdown areas - 4 times		
MCT cost benefit analysis		
Identify future electrical use and needed modifications.		
Mechanical demolition and removal is to be done by CT supplier.		
Identify future site restoration requirements to support new installation.		
If site reused		
If site not reused		
The removal of the Modular Cooling Towers must be coordinated with summer use requirements. Special sequencing must be identified in the schedule.		
Helper Cooling Tower resolution - validate & update Bechtel study, complete cost benefit analysis in conjunction with modular cooling towers.		
The Contractor will analyze the related information and discuss it with PEF to make a decision.		
Validate EPU heat added.		
Walkdown areas, estimated at 4 times		
Determine drift elimination requirements and determine testing methods (if applicable).		
Validate and update Bechtel study (fan use, height adjustment, drift elimination adjustment).		
Cost benefit analysis incorporating modular cooling tower decision.		
The upgrade of the Helper Cooling Towers must be coordinated with summer use requirements. Special sequencing must be identified in the schedule.		

Alternative Selection		
The Contractor will develop a list of potentially viable alternatives that should be included in the alternatives analysis. The Contractor will provide a reason each alternative should be included in the analysis. The Contractor will then work with PEF personnel to determine the alternatives to be included in the analysis.		
The Contractor will analyze the information related to the recirculation flow & temperature requirements, the decision on Modular Cooling Tower removal, the Helper Cooling Tower upgrades (if applicable), and the additional heat mitigation requirements to determine the best alternative or combination of alternatives. The contractor will work with PEF personnel in making this decision.		
The Contractor will also identify a proposed installation location and provide the reason for the location. Considerations in selecting the location will include site preparation and mitigations costs, constructability, and impact/interference with other CR operations.		
All the formal Contractor considerations and analysis must be documented and provided to PEF Project Manager.		
The Contractor will complete the following as part of this evaluation:		
Walkdowns of the areas.		
Determining drift elimination requirements and testing methods (if		
Develop a list of locations considered and associated advantages and disadvantages.		
Identify needed soil evaluations		
Complete buried utilities review		
Identify environmental concerns, permit requirements, and feasible mitigations.		
Develop alternatives selection report		
Develop Alternatives Analysis presentation.		
Complete Alternatives Analysis presentation at CR.		

Complete Conceptual Design		
The Contractor will complete a detailed scope description that identifies boundaries and interfaces with existing systems (site electrical, plant water, control room communications and distributed control system to name a few).		
Identify design parameters. Identify applicable codes and standards.		
Identify equipment locations for installation and reasons for selection. These are proposed locations that will need to be validated during the final design. However, adequate investigation and testing needs to be done to have a high level of confidence the location will not change substantially. Activities to accomplish this task are supported by and include:		
The Contractor will size equipment for operation and necessary maintenance while maintaining necessary recirculation flow.		
The Contractor will obtain, review, and markup electrical single line drawings and cable runs for all equipment. New drawings will be developed as required to identify the new and modified electric equipment in support of a final design.		
The Contractor will obtain, review, and markup P&ID drawings for all affected systems. New drawings will be developed as required to identify the new and modified equipment in support of a final design.		
The Contractor will obtain, review, and markup Piping drawings for all affected systems. New drawings will be developed were necessary to adequately support a firm fixed price contract for design of the new or modified system.		
The Contractor will obtain, review, and markup loop and control drawings for all affected systems. New drawings will be developed were necessary to adequately support a firm fixed price contract for design of the new or modified system.		
The Contractor will identify soils testing needed for selected installation location. The Contractor will identify the requirements, develop the technical specifications, and PEF will develop & coordinate the contract to obtain the soils information.		
The Contractor will identify under ground utilities location requirements. Contractor will identify the requirements and PEF will develop & coordinate the contract.		
The Contractor will identify installation requirements that are unique to the proposed design, installation, and/or startup of the equipment. This includes specific direction if field routing is not acceptable.		

The Contractor will state any assumptions made during the alternative selection in the alternatives analysis.		
The Contractor will state environmental conditions anticipated during storage, construction, and operation.		
The Contractor will identify environmentally sensitive areas near the construction areas. Identify the environmental permitting requirements for		
The Contractor will identify any interface requirements including definition of the functional and physical interfaces involving structures, systems and		
The Contractor will identify any precautions or limitations that need to be considered in completing the design.		
The Contractor will identify environmental considerations (e.g., maximum particulate carry over during evaporative processes).		
The Contractor will provide installation sketches and marked up drawings for electrical, I&C, and mechanical systems. Develop P&ID of recommended system(s).		
The Contractor will provide installation sketches and marked up drawings with civil/structural details.		
The Contractor will size the equipment and provide calculations developed during the alternative evaluation and selection process.		
The Contractor will provide suggested component and equipment selection and procurement specifications for long lead items.		
The Contractor will identify the performance requirements of the selected alternative systems and equipment, such as capacity, rating, and system output.		
The Contractor will identify material requirements such as electrical insulation properties, protective coating and corrosion resistance.		
The Contractor will state mechanical requirements such as vibration, stress, shock, and reaction forces.		
The Contractor will identify Structural requirements covering items such as equipment foundations and pipe supports.		
The Contractor will identify hydraulic requirements such as pump net positive suction heads, allowable pressure drops, and allowable fluid velocities.		
The Contractor will identify electrical requirements such as source of power, voltage, conduit requirements, electrical insulation and motor requirements. Provide the electrical power supply for each component and calculation of the total electrical power required for the project.		

The Contractor will state the on-site electrical power source that will be used to supply the project. List the major pieces of electrical equipment to be procured and installed in order to provide electrical power to the major electrical components.		
The Contractor will identify of the electrical power routing from the main distribution switchgear to transformer(s) and load center(s) to be used for the project.		
The Contractor will provide layout and general arrangement requirements and drawings.		
The Contractor will identify additional requirements such as inadvertent activation prevention devices, such as switch covers, key lock switches and other human factors considerations (i.e. handwheel locks) PEF personnel will assist.		
The Contractor will identify operational requirements and sequencing under various conditions, such as plant start-up, normal plant operation, plant shutdown, plant emergency operation, special or infrequent operation, and system abnormal or emergency operation, including postulated accident conditions. PEF personnel will assist in determining these criteria. Contractor will add the requirements into the design documents.		
The Contractor will state instrumentation and control requirements, including indicating instruments, controls, and alarms for operation, testing, and maintenance. Other requirements such as the type of instrument, installed spares, range of measurement, and location of indication should also be included. PEF personnel will identify desired instrumentation and alarms. The instrumentation and controls should be similar to existing equipment monitoring and control schemes. The existing DCS should be used if economical or a new system may be proposed. Contractor will evaluate the DCS, PEF will provide DCS design information to the Contractor.		
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If applicable, the Contractor will state redundancy, diversity and separation requirements of structures, systems, and components.		
Identify the failure effects on the requirements of structures, systems, and components, including a definition of those events and accidents that they must be designed to withstand (i.e. hurricane winds). PEF will provide operational requirements and the Contractor will establish the design requirements.		

The Contractor will identify system and component test requirements and the conditions under which they will be performed. Testing is to include operational demonstration of Air Permit requirements as well as component and system level testing (i.e. Megger test, continuity test, hydrostatic pressure test, pump performance test, & flow verifications). PEF will interface with FDEP to determine the acceptable emission testing.		
The Contractor will state cleanliness requirements, installation inspections, and flushing requirements.		
The Contractor will state component and system testing requirements.		
The Contractor will identify accessibility, maintenance, repair, and in-service inspection requirements for the equipment, including the conditions under which these will be performed (PEF personnel to assist).		
The Contractor will identify the on-site transportability requirements such as size and shipping weight, limitations.		
The Contractor will identify the fire protection or resistance requirements. PEF will concur with these requirements prior to acceptance.		
The Contractor will state that the design is to identify the handling, storage, and shipping requirements of procured material. PEF will identify how the Construction contractor will interface with the CR material receiving and storage group and provide that information to the Contractor for incorporation into the design requirements.		
The Contractor will identify safety requirements for preventing personnel injury including such items as restricting the use of dangerous materials, escape provisions from enclosures, and grounding of electrical systems. Identify plant procedures that address these hazards (i.e. Chemical Control). PEF personnel will assist in identifying site requirements and procedures.		
The Contractor will provide an Affected Documents List of site drawings and		
The Contractor will provide an estimate of new drawings that will be generated during the detailed design phase.		
The Contractor will prepare a Conceptual Design Report Package. Along with other design information, the conceptual design will include a design and construction schedule as well as a cost estimate for the design and construction efforts.		
The Contractor will prepare a Conceptual Design Review Presentation.		
The Contractor will complete the Conceptual Design Review Presentation at		
The Contractor will incorporate comments into the final design package and provide 5 copies (5 - electronic and 5 - hard copies) of the conceptual design package.		

The following is a summary of the bid evaluation process we just completed. I would like to place the Additional Additional Discharge Canal Cooling Capacity Study Phase contract with Sargent & Lundy based on the conclusions of this process. Please let me know if it is ok to place the contract or if you would like to see any of the spreadsheets we used during the evaluation process. I will get the Project Authorization form for the project

On August 27, 2007 the Additional Discharge Canal Cooling Capacity Project's Study Phase - Request for Proposal (RFP) was sent to ten Vendors that expressed an interest in bidding.

ECT
Golder Associates Inc.
Fluor
Enercon
Worley Parsons
Neil & Gunter Inc.
MPR, Inc.
Sargent & Lundy
Jacobs Engineering
Bechtel

Six of the ten Vendors stated that they would bid on the work and all but Worley Parsons attended the Project's walk through and RFP discussion on September 6, 2007.

Golder Associates, Inc.
Enercon
Worley Parsons
MPR, Inc.
Sargent & Lundy
Jacobs Engineering

One of the six (Golder Associates Inc.) did not bid.

On Friday (10/5/07) we received the bids from five potential Contractors for the Study Phase of the Additional Discharge Canal Cooling Capacity Project.

MPR, Inc.
Worley Parsons
Sargent & Lundy
Enercon
Jocobs

On Tuesday (10/9/07) I had a meeting with Mike Shrader, Dave Bruzek, Mike Olive, Ron Johnson, Dan Grannan, and Monte Burleson to evaluate the proposals. A formal bid selection process was used in reviewing each of the Vendor's bid packages. They were reviewed first for technical content and then the Vendor's estimated cost were Based on the Team's review of the potential vendor's bids, two of the Vendors (Worley Parsons and Sargent & Lundy) demonstrated a better understanding of the work scope, had more experience in doing the type of work, had more experienced personnel that could accomplish the work, and a reasonable estimated cost. Therefore,

The top two Vendors still had a different understanding of the work scope as indicated in their bids as wider than expected estimated cost spread. Therefore, I developed a detailed Requirements Matrix that identified tasks at a fairly low level of the work scope, as identified in the RFP. The thought process was to provide the Requirements Matrix to each Vendor and request them to identify the resources and man-hours associated with each task. The Vendors were told that they could adjust their bids to reflect the Requirements Matrix's work scope if necessary. The completed matrix could then be used to ensure the Vendors thought through and accounted for each task. This would validate an understanding of the work scope. In addition, the assigned man-hours could be used to identify were the Vendors devoted most of their time. This would indicate the Vendors' notion of task complexity

On Monday (10/22/07) I sent the Requirements Matrix to the top two Vendors. With the matrix I requested that they identify the type of resource and the number of man-hours each resource would spend on each task. The Vendors were requested to send back the completed matrix by close of business Thursday 10/24/07.

Both Vendors returned the Requirements Matrix by 10/24/07. However, upon review of the information Worley Parsons did not assign the resources as requested. Of the 1570 man-hours estimated for use on the project, only 618 man-hours were assigned to a specific task. This left approximately 2/3 of the man-hours unassigned or assigned in a global sense. The Vendor's understanding of scope could not be validated by the information

Another way to look at the information was to assume a common understanding of work scope and then just identify an average hourly cost for the requested work. Based on this approach Worley Parsons' estimated cost was $125.30 per hour and Sargent & Lundy estimated cost is $117.16. There are many uncertainties in trying to evaluate the two Vendors' proposal in this manner but it does have some value in understanding the value per

On Monday (10/29/07) I held a meeting with the Project's RFP selection team to discuss the Submittals from Sargent & Lundy and Worley Parsons. Attendees were; Monte Burleson, Mike Olive, Dan Gannan, & Ron Johnson. Mike Shrader was sent a copy of the material and I discussed it with him on the phone. Dave Buzek

The Vendors' submittals were reviewed and the comparison identified above was discussed. After the discussion process the Vendor selection team unanimously agreed that Sargent & Lundy should be awarded the contract in their initial bid package however, when contacted Worley Parsons stated that they did understand the work scope and their bid covered all the work.

(2)Worley Parsons did not estimate the work tasks, as identified by the Requirements Matrix, in enough detail to validate their understanding of scope and it appears that there is still some lack of understanding.

(3) Worley Parson stated that if they assigned hours to the Requirements Matrix, as requested, the estimate would inflate the man-hours beyond what they thought it would take to complete the work. This means that their estimate is more of a feeling than a detailed breakdown and assignment of resources.

(4) Worley Parsons did not understand the work scope and when asked again about specific scope they added time to cover the recirculation of flow to the Intake Canal, a major part of the alternatives analysis & conceptual design.

(5) The value per hour of Worley Parsons bid is higher than Sargent & Lundy's bid.

Potential Vendors for the Discharge Canal Alternatives Analysis and Conceptual Design

Environmental Consulting & Technology
3701 NW 98th St
Gainesville, Florida 32606

Phillip Simpson
352 332-0444

Golder Associates, Inc.
5100 West Lemon Street
Tampa, Florida 33609

Manitia Moultrie - Associate and Tampa Office Manager
T - (813) 287-1717
F - (813) 287-1716
C – (727) 403-2202

Fluor Enterprises, Inc.
100 Fluor Daniel Drive
Greenville, SC 29607-2762

Maxwell Pits
864-281-4400
Cell 864 363-8853

Enercon Services, Inc.
500 Townspark Lane
Kennesaw, GA 30144

Jim Gannon
770 919-1930

Worley Parsons
633 Chesstnut St. #400
Chattanooga, TN 37450

Bill Griffith
423 757-8020
e-mail William.d.griffith@worleyparsons.com

Jacobs Engineering
18302 Highwoods Preserve Parkway
Highwoods Plaza Suite 200
Tampa, Florida 33647

Ms. Nancy Hendrix
813 977-3434
nancy.hendrix@jacobs.com

Bechtel Power Corp.
5275 Westview Drive, 4B1
Frederick, MD 21703

Dick Miller
301 228-6215

Report # 24975.002

Neill & Gunter
8875 Hidden River Parkway Auite 300
Tampa, Florida 33637

Mark Noble
813 973-2387
Cell 813 404-5187

MPR Associates
Energy Services Group
320 King Street
Alexandria, Virginia 22314-3230

Tom Lubnow or Nick Marrone
703 519-0200

Mr. Steve Malak
Sargent & Lundy
55 East Monroe Street
Chicago, IL 60603

312 269-7407

Progress Energy

April 10, 2008

_____
_____
_____

Attn:_____

Subject: Progress Energy Florida, Inc.
Crystal River Discharge Canal Cooling Study
Request No. DH07-003

Dear Mr._____:

You are invited to submit a proposal for the evaluation and conceptual design of cooling options for Progress Energy's Crystal River South and Crystal River Unit 3 sites. Two (2) signed copies of the proposal (one priced and one unpriced) shall be sealed and marked "CONFIDENTIAL" and submitted to Deborah Hanna, Progress Energy Florida, Inc., 15760 W. Powerline Street (SA2C), Crystal River, FL 34428-6708. No copies of the proposal shall be distributed to any other Progress Energy personnel. Your proposal must be received no later than close of business September 29, 2007. If your proposal is received after that day or time, it will not be considered for the described work. Telephoned or faxed proposals or proposal information are unacceptable and will not be considered. No modifications to the proposal will be accepted after the bid due date and time specified above unless specifically requested in writing and approved by Progress Energy.

It is intended that a Contract in the form of the attached sample Contract will be awarded for this scope of work and quotations shall be made accordingly, unless the successful Vendor has an existing Master Contract with Progress Energy, in which case a Work Authorization will be released against that Master Contract incorporating the details of this Request for Proposal.

Progress Energy does not obligate itself to accept the lowest or any other bid and specifically reserves the right to reject any and all bids. Vendors are advised that all bids will be opened and evaluated solely by Progress Energy. All information contained in the bids submitted to Progress Energy and Progress Energy's evaluation, including any Vendor's relative position to the successful Vendor, is considered exclusive information of Progress Energy and will not be made available to any of the Vendors. All unsuccessful Vendors will be notified by Progress Energy in writing of the award of the work to another firm.

All requests for clarifications, interpretations or decisions on discrepancies pertaining to any of the proposal documents or related project data furnished as part of the proposal documents shall be made directly to Deborah.Hanna@pgnmail.com, (352) 563-4547.

It is the Vendor's responsibility to advise his potential subcontractors, suppliers, and other sub-vendors that information will be available only through the Vendor and that no direct contacts with Progress Energy by other firms shall be initiated. Information exchange shall be between Progress Energy and Vendor, and Vendor and his potential subcontractors. No work shall be subcontracted without the approval of Progress Energy. Subcontract work and proposed subcontractors must be identified in Vendor's proposal.

Please acknowledge receipt of this proposal and your bidding intentions by completing the attached Acknowledgement form. Bids will not be considered when submitted on forms other than those provided. Please fax the completed Acknowledgement form to Deborah Hanna at (352) 563-4464 before the close of business on September 4, 2007. Progress Energy will host a walk through of the applicable Crystal River areas on September 6, 2007 from 1 to 3 PM. The walk through will be followed by a question and answer session to ensure all the potential vendors understand the scope of this work.

PROGRESS ENERGY FLORIDA, INC.

By: _____

Deborah Hanna

Lead Contract Management Specialist

Attachments:

Acknowledgement
General Information
Scope and Other Requirements

ACKNOWLEDGEMENT

To: Deborah Hanna
Progress Energy Florida, Inc.
15760 W. Powerline St. (SA2C)
Crystal River, FL 34428-6708
Fax: 352-563-4464

In regards to: Progress Energy Florida, Inc.
Crystal River Discharge Canal Cooling Study
Request No. DH07-003

I acknowledge receipt of the subject proposal package and have indicated my bidding intentions as follows:

☐ I have reviewed the proposal documents and will not be submitting a bid for this work.

☐ I have reviewed the proposal documents and intend to submit a bid for this work.

☐ I plan to attend the facility walkthrough and solicitation discussion on September 6, 2007.

_____
(Signature)

_____
(Name)

_____
(Title)

_____
(Company)

_____
(Date)

PEF-NCR-00428

GENERAL INFORMATION

In the event that your Proposal is accepted and a Contract is awarded to the firm whose full legal company name appears herein below, Mr./Ms. _____, whose title is _____, will be executing the Contract on behalf of the firm. Should this person's title not indicate that he/she is a corporate officer (president, vice president, or corporate secretary), an affidavit signed by a corporate officer shall be provided along with the bid, stating that the person whose name appears above is duly authorized to execute contracts on behalf of the firm.

The Contractor is: (select appropriate line and complete information)

An Individual: _____

A Corporation of the State of: _____

A Partnership consisting of: _____

A Joint Venture comprised of: _____

Full Legal Company Name _____

Business Address _____

_____

_____

Mailing Address _____
(if different)

_____

_____

Contact Name _____

Contact Phone _____

Contact E-Mail _____

Company Website _____

Federal Tax ID Number _____

Contractor's License Number (if applicable) _____ State of Issuance _____

In accordance with the Federal Acquisition Regulation section 52.219, please check all that apply to your company. Please provide supporting documentation or certification to confirm the status for any categories checked under Small/Diverse Vendors.

[ ] Certified small business* [ ] HUBZone, 8(a) or disadvantaged business*
[ ] Veteran-owned business* [ ] Minority-owned business * *
[ ] Service-disabled veteran-owned business* [ ] Women-owned small business * *
[ ] Not a Small Business

* As defined by the Small Business Administration (SBA): www.sba.gov
* * Certified by Progress Energy and as defined by SBA.

Register online at www.progress-energy.com/supplierdiversity

BY: _____

NAME (printed): _____

TITLE: _____

DATE: _____

SCOPE AND OTHER REQUIREMENTS

I. Background

Progress Energy Florida, Inc. (PEF) plans to increase the electrical power output of its nuclear reactor – Crystal River Unit 3 (CR3) – located in Crystal River, FL via an Extended Power Uprate (EPU) scheduled for completion in 2011. The planned changes will increase the licensed core power from 2568 MWt (903 MWe) to 3014 MWt (1080 MWe), an electrical improvement of roughly 20%. A direct result of the augmented electrical generation will be an increase in heat rejected from the circulating water system through the once-through condensers and into the discharge canal. Without mitigation, the corresponding increase in dissipated heat is expected to affect the permitted discharge temperature limit of 96.5 °F.

CR3 shares a common discharge canal with two adjacent coal-fired units, CR1 (400 MW) and CR2 (500 MW). The common discharge canal currently has 36 cells of helper (mechanical draft) cooling towers plus 67 additional modular cooling towers that operate during the summer months to cool a portion of discharge canal water to comply with permit limits. However, even with the helper and modular cooling towers, high discharge canal water temperatures periodically cause CR1 and CR2 to de-rate so as not to exceed the permitted National Pollutant Discharge Elimination System (NPDES) limit. After the 2011 EPU implementation, operation of CR1 and CR2 will be further impacted by the increase in discharge canal water temperature without any mitigation.

PEF developed and submitted a Site Certification Application (SCA) to the Florida Department of Environmental Protection (FDEP) as part of the EPU permitting process. One of the possible mitigating actions submitted in the SCA was the use of additional cooling towers. Applicable sections of the SCA are included in Attachment C. Although cooling towers were mentioned in the SCA, the use of cooling towers may not be the best alternative. As a result, this Request for Proposal (RFP) has been developed to determine the best thermal mitigation alternative.

II. Vendor Scope of Work

The Scope of Work is divided into two phases. Phase I is to evaluate alternatives for reducing the discharge canal water temperature in order to (1) accommodate the planned thermal increase associated with CR3's EPU, (2) minimize the effect on full-load operation of CR1 and CR2 and potentially eliminate necessary de-rates of either unit, and (3) comply with all existing and proposed environmental permits, including re-circulating water from the discharge canal to the intake canal to offset increased condenser flow from CR3's EPU and address 316(b) requirements. The goal of this study is to evaluate the potentially viable alternatives, compare the alternatives, and recommend the most cost effective and technically feasible alternative. The Study Report will be structured using the outline provided in Attachment B. Phase II of this work scope is to develop a conceptual design, general cost estimate (±25%) and high-level

schedule for the Project's implementation.

Phase I
The alternatives analysis shall contain sufficient design consideration (e.g., equipment sizing, quantity, and materials) to determine whether it is technically and economically feasible to implement each alternative. The following list provides the expected alternatives, in whole or in combination, for this evaluation.

- Evaluation of cooling alternatives, including, but not limited to, the following:
  - ⇒ New Cooling Towers
  - ⇒ Modifying Existing Cooling Towers
    - o Upgrade Helper Cooling Towers (fans, stacks, or fill)[1]
    - o Eliminate Modular Cooling Towers
  - ⇒ Evaporative Cooling
  - ⇒ Inlet/Discharge Chillers
  - ⇒ Air Spargers/Bubblers[2]
- Analysis of each alternative including, but not limited to, the following:
  - ⇒ Economic Cost Estimate (including the basis for the estimate)
  - ⇒ Schedule Analysis
  - ⇒ Quantity and Size of Equipment
  - ⇒ Infrastructure Requirements (e.g., electrical needs)
  - ⇒ Proposed location(s) considered for the alternative
  - ⇒ Site Impacts (e.g., environmental, operational and maintenance)
  - ⇒ Advantages and Disadvantages Relative to Other Options
- Identify environmental impacts for each alternative[3]
  - ⇒ Wetlands Mitigation
  - ⇒ Biota Impingement and Entrainment Issues
- Preparation of an Alternatives Summary Report comparing the alternatives and an on-site presentation (to plant personnel) of the selection results.

Phase II
The recommended alternative shall be developed into a conceptual design, which shall contain sufficient detail to prepare a request for proposal (RFP) package for the final equipment procurement and design. Section X of this document identifies the level of detail expected in the conceptual design report. PEF expects that the conceptual design can be used as the stand alone engineering design input document for the final design.

This work is NOT nuclear safety related and does not need to be completed under the Vendor's

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[1] Helper Cooling Tower upgrades were evaluated previously (additional References – Bechtel Cooling Water Study).
[2] Bubble cooling was previously reviewed (additional References – John Cooper & Associates Engineering Evaluation).
[3] PEF will perform detailed review of 316(b) impacts; Vendor is not expected to coordinate any interaction with permit agencies. PEF expects the Vendor to identify possible environmental impacts, as well as solutions, for each alternative.

Appendix B program.

The technical details and requirements for each of the items associated with this scope of work are discussed in the following sections.

III. Owner Scope of Work

PEF personnel will work with the selected Vendor in obtaining additional information (e.g., wetland surveys, civil engineering drawings, and plant electrical drawings) to support the evaluation. The selected Vendor should expect a one day turn around time for on site delivery of drawings and an additional one to two days time for off site delivery. PEF personnel will coordinate the Vendor's CR site indoctrinations, badging, and specific training, as required.

After the Phase I alternative selection, an economic analysis will be performed using PEF's in-house EESY+ software. PEF will input the Vendor's supplied data into EESY+ and provide the output results for incorporation into the final study report. The Vendor will review the EESY+ input for accuracy and review/incorporate the output results into the study.

IV. Technical Details

Vendor shall conduct a thorough review of design alternatives to reduce the discharge canal water temperature and satisfy the stated Project objectives following CR3's EPU. This evaluation shall include a technical analysis of design variables such as discharge canal temperature variation, ambient temperatures, and environmental restrictions. Specific data related to the unit operations following the EPU are included below. Additional information will be supplied by PEF after contract award and requested by the selected vendor.

- CR1 full-load operation
  - ⇒ 245,000 gpm Circulating Water Flow (actual)
  - ⇒ ~17 °F Circulating Water Temperature Rise Through Condenser
- CR2 full-load operation
  - ⇒ 308,000 gpm Circulating Water Flow (actual)
  - ⇒ ~14 °F Circulating Water Temperature Rise Through Condenser
- CR3 full-load operation
  - ⇒ 832,000 gpm Circulating Water Flow
  - ⇒ ~17 °F Circulating Water Temperature Rise Through Condenser
  - ⇒ .768 MBtu/hr of Additional Heat Dissipated due to EPU
- (Hamon) Helper Cooling Towers operation
  - ⇒ 4 blocks of 9 cells
  - ⇒ 686,000 gpm Total Water Flow
  - ⇒ 89.5 °F Design Outlet Temperature (based on 103 °F inlet and 81 °F wet bulb)
- (Aggreko) Modular Cooling Tower operation
  - ⇒ 67 individual cells
  - ⇒ 180,000 gpm Total Water Flow

⇒ 90 °F Design Outlet Temperature (based on 103 °F inlet and 81 °F wet bulb)

- Project Objectives
  - ⇒ Allow Full-Load Operation of CR1, CR2 and CR3 during Summer
  - ⇒ Plan for Maximum Design Intake Water Temperature of 91 °F
  - ⇒ Comply with 96.5 °F Point of Discharge (POD) 3-hr Rolling Average
  - ⇒ Maintain a maximum Permitted Discharge Flow Rate of 1,320,000 gpm (or 1,897.9 Mgpd) by returning cooled discharge canal water (approximately 152,000 gpm) to the intake canal.
- Additional Data
  - ⇒ Intake canal cannot be blocked due to barge traffic.
  - ⇒ Though additional cooling capacity is only required during summer months, re-circulating water flow back to the intake canal is necessary year round.
  - ⇒ The return water from discharge to intake canals will be designed for most efficient and cost effective mitigation of biota entrainment and impingement.

V. REFERENCES

The following reference documents are provided as part of this RFP. These documents are located in Appendix C.

1. PEF Safety Plan
2. Site Land Use Classification Map
3. Applicable Sections of the Site Certification Application
4. Historical Data of Circulating Water Temperatures
5. Helper Cooling Tower Performance Curves
6. Modular Cooling Tower Performance Curves
7. Local Annual Windrose
8. Request for Information Form

Additional documents will be provided following contract award. Other data that may be provided to facilitate technical evaluations, as requested.

- Site civil engineering drawings
- Site electrical drawings
- Wetland surveys
- Site Certification Application
- Bechtel Cooling Water Study
- John Cooper & Associates Engineering Evaluation

VI. PEF Contacts

Contractual: Deborah Hanna
Telephone: (352)563-4547
E-mail: Deborah.Hanna@pgnmail.com

Technical: Mark Gillespie or Mark Hickman
Telephone: (352) 795-0504 x6926 or (352) 563-2943 x4233
Email: mark.gillespie@pgnmail.com or mark.hickman@pgnmail.com

VII. Work Control

The majority of the work is expected to be completed at Vendor's facility. However, one cubicle with 2 desks and 2 chairs will be provided (if requested) at Crystal River for the selected Vendor's use. Vendor shall be responsible for all office supplies, equipment and personnel protective equipment (e.g., hard hat, safety glasses and safety shoes). Vendor shall be responsible for identifying personnel that need access on Site and shall coordinate temporary badges and training so as not to impact the schedule of work.

The selected Vendor shall establish a Request for Information (RFI) Log to track information transmitted between PEF and Vendor. The RFI form (see Attachment C) will be completed for all questions on the Project that need formal clarification. RFI's shall be used to resolve any questions related to Project scope, schedule or cost. Additionally, RFI's may be used to request drawings or other documents not accessible to Vendor or to document equipment or system specifications.

Vendor shall conduct weekly status meetings/teleconferences with PEF Project personnel. Vendor shall distribute an agenda (with input from PEF) prior to the meeting, take minutes and distribute the minutes after the meeting. PEF personnel will have an opportunity (1 working day minimum) to comment on the meeting minutes before they are submitted as final. Minimum topics to be covered at each meeting are:

- Safety topic
- Earned value status (cost vs. schedule)
- Projected Estimate at Completion (EAC)
- Accomplishments/Milestones
- Issues/Request for Information
- Scheduled accomplishments for next week
- Number of personnel working on the project (last week and next week)

The Vendor shall conduct a Phase I completion and 90% project completion review meetings with PEF personnel at CR. Vendor shall distribute an agenda (with input from PEF personnel) prior to the review, take minutes and distribute the minutes after the review. PEF personnel will have an opportunity (4 working days minimum) to comment on the review meeting minutes before they are submitted as final. Minimum topics to be covered at each review are:

- Safety topic
- Earned value status (cost vs. schedule)

- Projected EAC
- Accomplishments
- Presentation of completed documents for approval
- Issues
- General discussion (question & answers)

Vendor shall perform technical evaluation of cooling alternatives and complete a conceptual design of the recommended solution. Interaction between PEF and Vendor is expected to clarify any comments on alternatives as well as to identify site restrictions that may not have been considered.

Vendor shall attend a mandatory Kick-Off Meeting prior to the start of work, to be set up when the contract is issued.

VIII. Schedule:

The following sequence of activities identifies the formal reviews and deliverables for the work. Vendors are required to submit a schedule with the required time line completed. The stated scope of work is required to be complete by January 31, 2008.

- RFP sent to Vendors
- September 4, 2007 – Submit Acknowledgement Form
- September 6, 2007 – Walkdown and RFP Discussion at Crystal River
- October 5, 2007 – Proposals Due [Approx. 4 WEEKS TO PREPARE]
- October 11, 2007 – Contract Award Notice to Proceed (NTP)
- ≤1 Week After NTP – Kick-Off Meeting (at Crystal River Site)
- ~ 5 Weeks After NTP – Phase I Completion Review (Alternative Selection on or before this review) and Presentation of Report (at Crystal River Site).
- ~ 14 Weeks After NTP – Conceptual Design Draft (90% Completion) Report
- ~ 15 Weeks After NTP – PEF comments on Draft Report
- ~ 16 Weeks After NTP – Final Report
- ~ 16 Weeks After NTP – Presentation of Report (at Crystal River Site)

The selected Vendor is required to change this time line into a schedule that contains meaningful milestone and deliverable dates within one week of NTP. Project completion must not exceed January 31, 2007.

Vendors are encouraged to identify any dates that can be improved in the above schedule.

IX. Quality Assurance

Quality Assurance (QA) and Quality Control (QC) shall be accomplished under Vendor's internal QA/QC Program. Vendor's QA/QC Program shall be submitted to PEF for review with their proposal.

X. Technical Documentation and Submittal Requirements

Phase I

Finalize the list of alternatives to be evaluated and obtain Alternative Evaluation List approval from PEF Project Manager. Complete the alternatives analysis and draft the Alternatives Summary Report. The selected Vendor shall work with PEF personnel to determine a recommended alternative for implementation after the alternative analysis is complete. A preliminary draft of the Phase I alternatives summary report shall be submitted to PEF for review and comment 5 days prior to final document submittal and presentation at Crystal River. The final Alternatives Summary Report shall be approved by PEF before starting the conceptual design. The final alternatives analysis will identify additional testing and information that is required in order to complete the conceptual design (i.e. underground utilities location, soils sampling, etc.).

Five copies of the final Alternatives Summary Report shall be supplied to PEF.

Phase II

The Vendor shall then develop a Conceptual Design of the selected alternative. The design shall have sufficient detail that the information can be used as the primary input for the detailed design. PEF personnel will supply site specific criteria for Vendor inclusion in the conceptual design document as identified below. At a minimum, the Conceptual Design will include the following:

- Provide a detailed scope description. The description should include the boundaries and interfaces with existing systems (i.e., site electrical, helper and modular cooling towers).
- Identify the location(s) for installation and reason for selection, including any testing data that was used to aid in the site selection.
- Identify any exclusions or caveats that were considered during alternative selection.
- Identify applicable codes and standards.
    - State design conditions such as seismic loads, wind speeds, thermal and dynamic loads, system pressure and temperatures, and chemical considerations.
- Identify installation requirements that are unique to the proposed design, installation, and/or startup of the equipment. Include specific direction if field routing is not acceptable.
- Identify any assumptions made during the alternative selection.
    - State environmental conditions anticipated during storage, construction, and operation.
    - Identify environmentally sensitive areas near the construction areas. Identify the environmental permitting requirements for the construction.

    - Identify any interface requirements including definition of the functional and physical interfaces involving structures, systems and components.
- Identify any precautions or limitations that need to be considered in completing the design.
    - Identify environmental considerations (e.g., maximum particulate carry over during evaporative processes).
- Provide installation sketches and marked up drawings for electrical, I&C, and mechanical systems. Develop P&ID of recommended system(s).
- Provide installation sketches and marked up drawings with civil/structural details.
- Provide calculations developed during the alternative evaluation and selection process.
- Provide suggested component and equipment selection and specifications.
    - Identify the performance requirements of the selected alternative systems and equipment, such as capacity, rating, and system output.
    - Identify material requirements such as electrical insulation properties, protective coating and corrosion resistance.
    - State mechanical requirements such as vibration, stress, shock, and reaction forces.
    - Identify Structural requirements covering items such as equipment foundations and pipe supports.
    - Identify hydraulic requirements such as pump net positive suction heads, allowable pressure drops, and allowable fluid velocities.
    - Identify electrical requirements such as source of power, voltage, conduit requirements, electrical insulation and motor requirements. Provide the electrical power supply for each component and calculation of the total electrical power required for the project.
    - State the on-site electrical power source that will be used to supply the project. List the major pieces of electrical equipment to be procured and installed in order to provide electrical power to the major electrical components.
    - Identify of the electrical power routing from the main distribution switchgear to transformer(s) and load center(s) to be used for the project.
    - Provide layout and general arrangement requirements.
    - Additional requirements such as inadvertent activation prevention devices, such as switch covers, key lock switches and other human factors considerations (i.e. handwheel locks) may be provided by PEF personnel.
- Identify operational requirements and sequencing under various conditions, such as plant start-up, normal plant operation, plant shutdown, plant emergency operation, special or infrequent operation, and system abnormal or emergency operation, including postulated accident conditions. PEF personnel will assist in determining these criteria.
- State instrumentation and control requirements, including indicating instruments, controls, and alarms for operation, testing, and maintenance. Other requirements such as the type of instrument, installed spares, range of measurement, and location of indication should also be included. PEF personnel will identify desired instrumentation and alarms. The instrumentation and controls should be similar to existing equipment monitoring and control schemes.

- Access and administrative control requirements for plant security (PEF personnel to identify).
- If applicable, state redundancy, diversity and separation requirements of structures, systems, and components.
- Identify the failure effects on the requirements of structures, systems, and components, including a definition of those events and accidents that they must be designed to withstand (i.e. hurricane winds).
- Identify system and component test requirements and the conditions under which they will be performed.
- Identify accessibility, maintenance, repair, and in-service inspection requirements for the equipment, including the conditions under which these will be performed (PEF personnel to assist).
- Identify the on-site transportability requirements such as size and shipping weight, limitations.
- Identify the fire protection or resistance requirements.
- State that the design is to identify the handling, storage, and shipping requirements of procured material.
- Identify safety requirements for preventing personnel injury including such items as restricting the use of dangerous materials, escape provisions from enclosures, and grounding of electrical systems. Identify plant procedures that address these hazards (i.e. Chemical Control). PEF personnel will assist in identifying site requirements and procedures.
- Provide an Affected Documents List of site drawings and procedures.
- Provide an estimate of new drawings that will be generated during the detailed design phase.
- Prepare a Conceptual Design Report Package.

Drawings shall be performed and submitted in US standard units (i.e. feet, lbs, kips, inches). All engineering drawings and calculations will be reviewed and approved by a registered Professional Engineer.

Five copies of the final conceptual design documents shall be supplied to PEF.

XI. Deliverables:

Phase I
Kickoff meeting agenda and minutes
List of alternatives to be analyzed
Weekly meeting agenda, status, & minutes
Draft Alternatives Summary Report (5 copies)
Final Alternatives Summary Report (5 copies) and Presentation

Phase II
Updated project schedule
Weekly meeting agenda, status, & minutes

Draft Conceptual Design Report (5 copies)
Final Conceptual Design Report (5 copies) and Presentation

XII. Additional Information:

PEF will hold a pre-bid meeting with interested Vendors to clarify questions and expected scope. The meeting will be held on September 6, 2007 from 1 to 3 pm.

XIII. Attachments:

A. Bid Requirements
B. General Study Outline
C. PEF Technical Documentation

Attachment A. Bid Requirements

Vendor shall provide the following information with their proposals.

1. Company's resume providing qualifications and references that demonstrate Vendor's capability to complete the work.
2. Vendor's organization chart identifying how this work will be managed as well as interface points with PEF.
3. Resumes of personnel intended to be used on this project. These resumes will be evaluated as part Vendor's qualification to accomplish the stated scope of work.
4. Commitment to start work within ten (10) days of the Notice to Proceed.
5. Company safety statistics.
6. Classification of each type person associated with the work scope.
7. Hourly billing rates for each classification (straight time/overtime or all-hours rate)
8. Billable travel and living expenses.
9. Estimated man-hours for each personnel classification.
10. This contract will be completed as a Time & Materials contract, divided into two phases. Provide a maximum not-to-exceed contract dollar amount for each phase of the work described in this RFP.
11. Provide a description of the suggested approach the Vendor will take to complete this work. The approach description should:
    - be consistent with the estimated cost and schedule,
    - include the expected manpower (by classification) needed for each phase of the work,
    - demonstrate that the Vendor understands the work scope & schedule requirements,
    - identify what work will be completed at Crystal River and the work to be completed at the Vendor's facility,
    - include potential problems that could affect the project cost or schedule,
    - include methods to control contract costs,
    - describe the Vendor's earned value system that will be used to monitor and report project cost (this description should demonstrate that the Vendor has the capability to properly identify, monitor, collect, analyze, and report project costs),
    - identify opportunities to improve the project's completion.
12. Provide a schedule for accomplishing this scope of work that contains the sequence of activities in Section VIII.
13. QA/QC Program Manual &/or Procedures to be followed in completing the work.
14. Health & Safety (H&S) Plan or agreement to comply with the PEF's H&S Plan.

SPECIAL REQUIREMENTS:

Confidentiality:
All RFP drawings, specifications, and contractual documents will remain the property of Progress Energy and are to be returned in good condition within ten (10) days after the date set

for receiving bids. RFP documents shall not be reproduced or used for any purpose other than for the preparation of a proposal in accordance with this request. The information contained in these documents is proprietary and confidential and shall be maintained in strict confidence.

RFP Interpretation:
An interpretation request shall be made to Progress Energy if a Vendor is in doubt as to the true meaning of any part of the drawings, specifications, or contractual documents. Modification of the documents will be made only by written addendum issued to each Vendor as described below.

RFP Exceptions:
If a Vendor's proposal contains any deviations or exceptions, those deviations or exceptions must be specifically identified on a single separate attachment to the proposal in order to be considered in the evaluation. If not so identified, the deviations or exceptions will not be considered part of the proposal. Conditional proposals based on Vendor-generated clarifications may not be accepted. If a Vendor takes any exceptions in addition to those submitted in accordance with this section, that Vendor's proposal may be rejected by Progress Energy.

RFP Approved Equal Evaluation:
Submittals by Vendor for evaluation of products as "approved equal" shall be made to the appropriate designated individual listed in the Request for Proposal at least ten (10) days prior to the proposal due date. Results of evaluations will be provided no later than seven (7) days prior to the proposal due date. Submittals made later than ten (10) days prior to the proposal due date will not be considered.

RFP Addenda:
Progress Energy reserves the right to amend or clarify requirements herein by Addenda. An addendum may be issued at any time prior to the date for receipt of proposals and may be mailed or otherwise delivered to all Vendors who have been invited to bid. Request by a Vendor for extension of the proposal due date shall be received by Progress Energy at least one week prior to the then scheduled date. If revisions or clarifications are of magnitude to warrant, in the opinion of Progress Energy, the extension of the date set for receipt of proposals, an addendum will be issued announcing the new date. Failure of a Vendor to acknowledge receipt of any addendum in the space provided on the proposal form may result in rejection of that proposal.

Safety:
Progress Energy is committed to using safety conscious contractors. To this end, Progress Energy collects safety-related data voluntarily provided by all persons performing or desiring to perform Progress Energy work. This data is compiled and made available to Progress Energy employees via Progress Energy's intranet. This intranet system is accessible by non-Progress Energy employees, and thus, so will be any safety-related information you provide. In providing the safety-related information requested herein, to Progress Energy or to any other person doing business, directly or indirectly, with Progress Energy, the undersigned contractor explicitly authorizes Progress Energy to disclose said information to non-Progress Energy persons and hereby releases Progress Energy and its agents and employees from any cause of action or claim

for damages related to said disclosures.

Nuclear Requirements:
This work is NOT classified as Nuclear Safety Related and does not need to be accomplished under the vendor's Appendix B Program.

Attachment B. Alternatives Analysis Report Outline

1. Title/Signature Page
   i. Contact Information
2. Executive Summary
3. Table of Contents
4. Introduction
   i. Project Description
   ii. Preliminary Scope Statement
   iii. References
   iv. Existing Unit Overview
5. Design Criteria
   i. Design Objectives
   ii. Design Parameters
6. Evaluation of Alternatives
   i. General Descriptions
      - Equipment
      - General layout
   ii. Technical Evaluation
      - Operating parameters
      - Ability to meet project requirements
   iii. Economic Analysis
      - Equipment
      - Site preparation
      - Installation/construction
      - Operating costs
   iv. Environmental Issues
      - Location / site preparation
      - Operating
      - Potential mitigation actions required
   v. Estimated Cost
      - Equipment
      - Site Preparation
      - Installation / construction
      - Operation
      - Maintenance
   vi. Estimated Schedule
7. Recommended Solution
8. Attachments

Attachment C. PEF Technical Documentation

1. PEF Safety Plan
2. Site Land Use Classification Map
3. Applicable Sections of the Site Certification Application
4. Historical Data of Circulating Water Temperatures
5. Helper Cooling Tower Performance Curves
6. Modular Cooling Tower Performance Curves
7. Local Annual Windrose
8. Request for Information Form

PEF Safety Plan

Site Land Use Classification Map

Applicable Sections of the Site Certification Application

Historical Data of Circulating Water Temperatures

Helper Cooling Tower Performance Curves

Modular Cooling Tower Performance Curves

Local Annual Windrose

RFI Number:	
Discharge Canal Thermal Mitigation Project Request for Information (RFI) Form	
Date: Initiator:	Contractor's Project Manager Approval:
Description of Request, Issue, Concern	
Suggested resolution:	
Date that response is needed by to prevent Project impact:	
Potential Impact	
Scope ☐ ☐ Schedule ☐ ☐ Cost ☐ ☐ Safety ☐ ☐	
Description of Impact:	
Progress Energy Direction, Resolution, Clarification	
Approval:	
Project Manager:	
Procurement Specialist:	

OPC
1ST POD

#1

080009

BATES NOS. PEF-NCR-00454 THROUGH PEF-NCR-00533

NON-RESPONSIVE

OPC

1ST POD

#1

080009

BATES NOS. PEF-NCR-00534 THROUGH PEF-NCR-00549

NON-RESPONSIVE

10/08/07
3:00 PM

Sargent & Lundy LLC

C. A. Sward
Project Manager
312-269-7426
312-269-2208(FAX)
chris.a.sward@sargentlundy.com

October 4, 2007
Proposal No. 00273-576
Letter No. SLCR3-2007-019

Proposal for Engineering Services for
Crystal River Discharge Canal Cooling Study

Ms. Deborah Hanna
Progress Energy Florida, Inc.
15760 West Powerline Street (SA2C)
Crystal River, Florida 34428-6708

Dear Ms. Hanna:

Sargent & Lundy, LLC (S&L) is pleased to provide Proposal No. 00273-576, "Engineering Services for the Crystal River Discharge Canal Cooling Study" in response to Progress Energy's Request No. DH07-003. Sargent & Lundy is ready to begin this work with a unique analytical approach and highly qualified staff.

Sargent & Lundy will perform this scope of work in accordance with our general services agreement, Contract No. 257117, and the Sargent & Lundy Quality Assurance Manual that has been reviewed and accepted by Progress Energy. We will perform the work with our in-house staff and will not subcontract any of the work. Company safety statistics and our health and safety plan are included with the enclosed Contractor's Safety Information/ Checklist Form. All of the other Bid Requirements of Attachment A of the Request are included in the enclosed proposal.

We thank you for the opportunity to submit this proposal. Should you have any questions, please call Mr. Robert Field at 312-269-3909 or me.

Yours very truly,

Chris Sward

Chris Sward
Project Manager

CAS
Enclosures:
1. Completed "General Information" form
2. Contractor's Safety Information/Checklist Form
3. Priced copy of Proposal Number 00273-576
4. Un-priced copy of Proposal Number 00273-576

Copies:
J. D. Regan (1/0)
R. M. Field (1/0)
File: LAN

GENERAL INFORMATION

In the event that your Proposal is accepted and a Contract is awarded to the firm whose full legal company name appears herein below (Mr./Ms.) John Regan, whose title is Sr. Vice President, will be executing the Contract on behalf of the firm. Should this person's title not indicate that he/she is a corporate officer (president, vice president, or corporate secretary), an affidavit signed by a corporate officer shall be provided along with the bid, stating that the person whose name appears above is duly authorized to execute contracts on behalf of the firm.

The Contractor is: (select appropriate line and complete information)

An Individual: _____

✓ A Corporation of the State of: Illinois

A Partnership consisting of: _____

A Joint Venture comprised of: _____

Full Legal Company Name Sargent & Lundy, LLC

Business Address 55 E. Monroe St.

Chicago, IL 60603

Mailing Address (if different) _____

Contact Name Chris Suard

Contact Phone 312-269-7426

Contact E-Mail chris.a.suard@sargentlundy.com

Company Website sargentlundy.com

Federal Tax ID Number 36-1729848

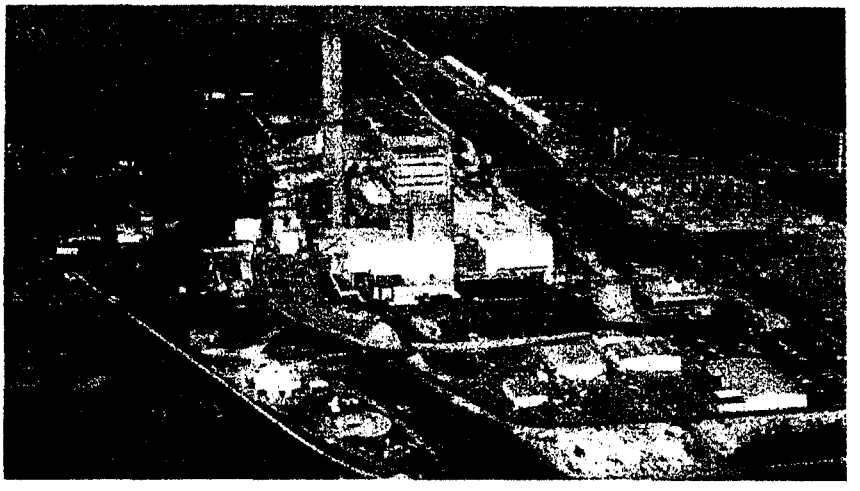
10/09/07
3:00 PM

PRICED PROPOSAL

ENGINEERING SERVICES
CRYSTAL RIVER DISCHARGE CANAL COOLING STUDY

Submitted To
PROGRESS ENERGY FLORIDA
CRYSTAL RIVER ENERGY COMPLEX

Progress Energy



REQUEST NO. DH07-003

PROPOSAL NUMBER 00273-576

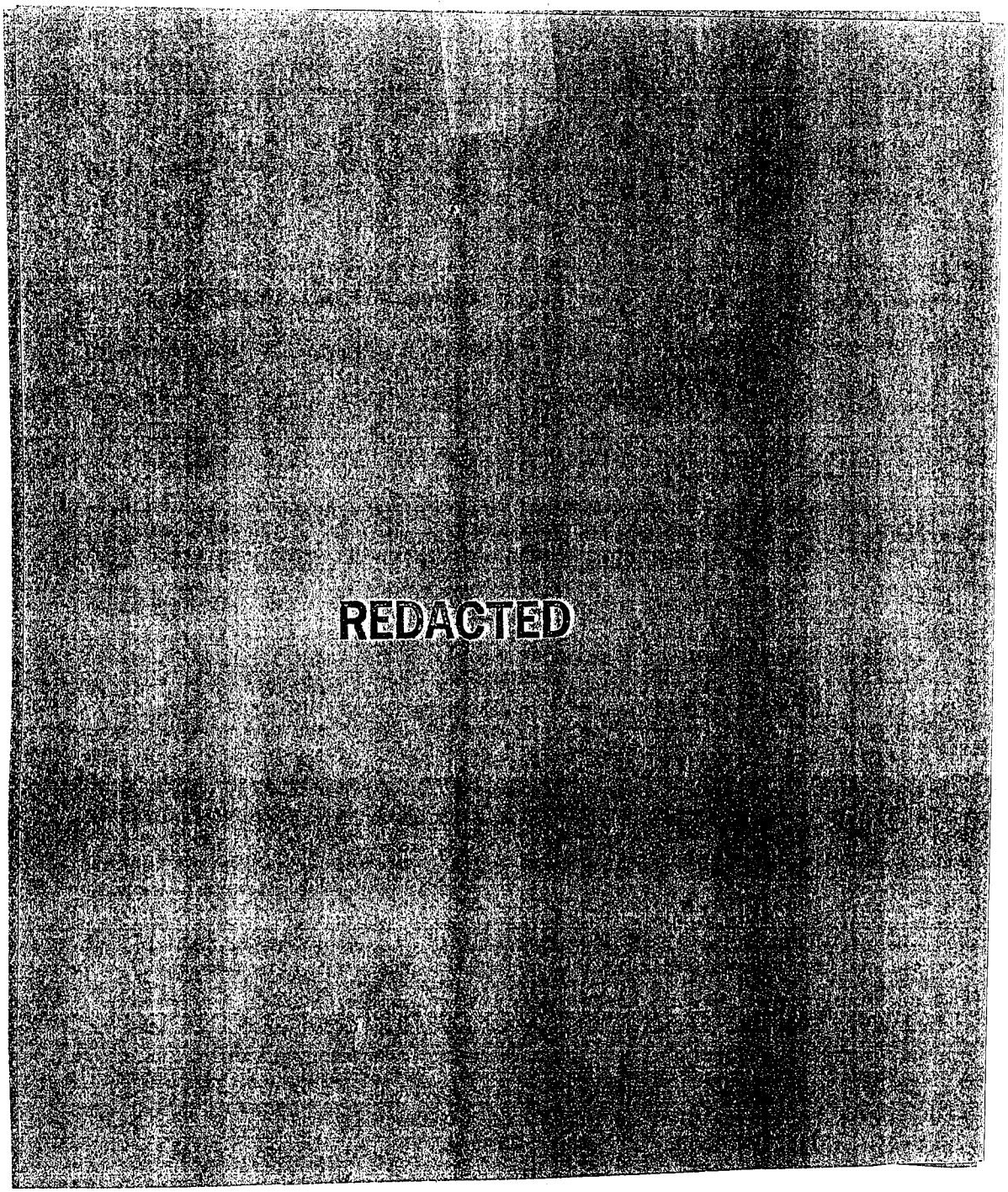
OCTOBER 5, 2007

SUBMITTED BY

Sargent & Lundy LLC

This document contains information which is confidential and proprietary to Sargent & Lundy (S&L). It shall not be reproduced in whole or in Part or released to any third party without the prior written consent of S&L.

1.0 OVERVIEW



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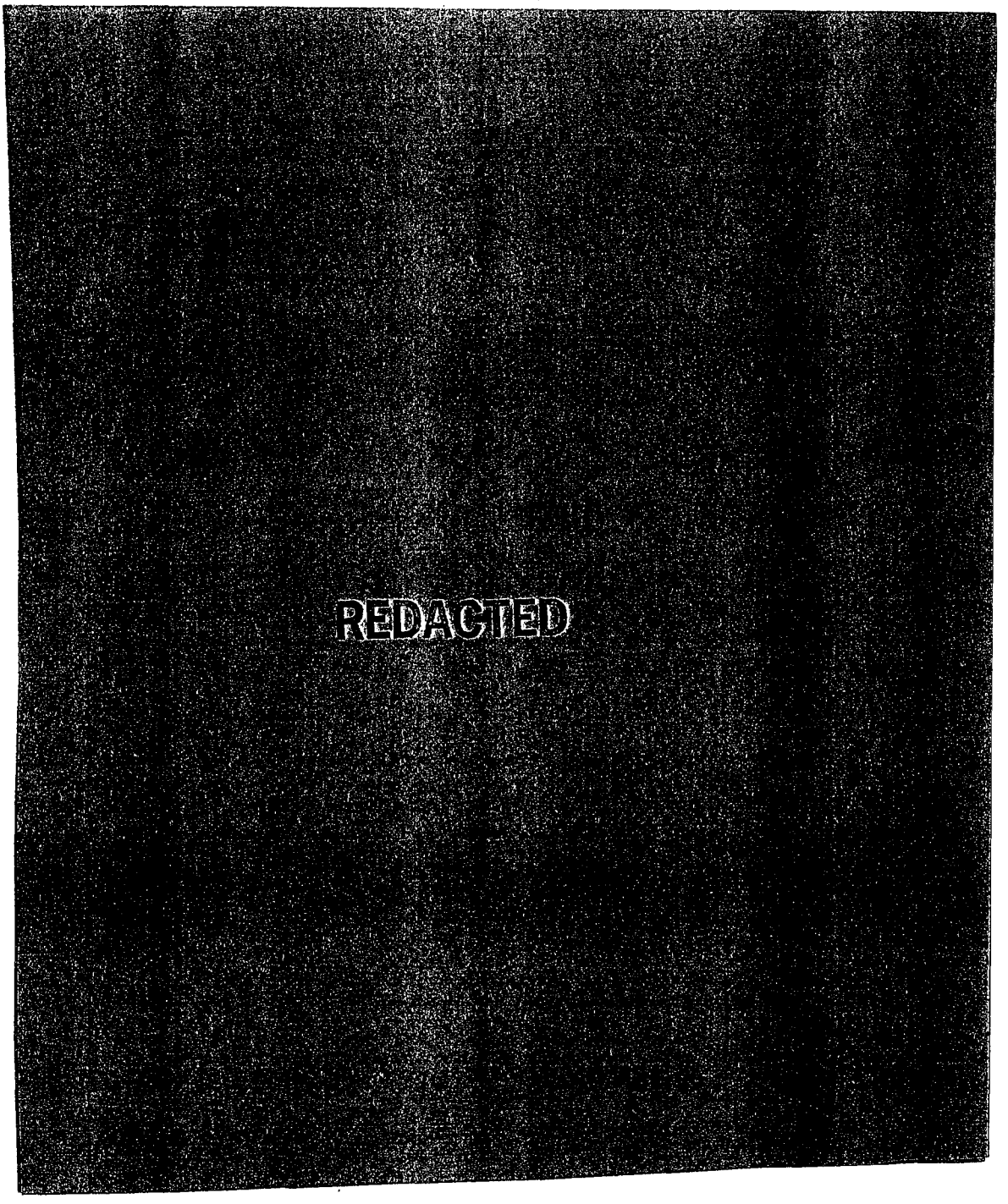

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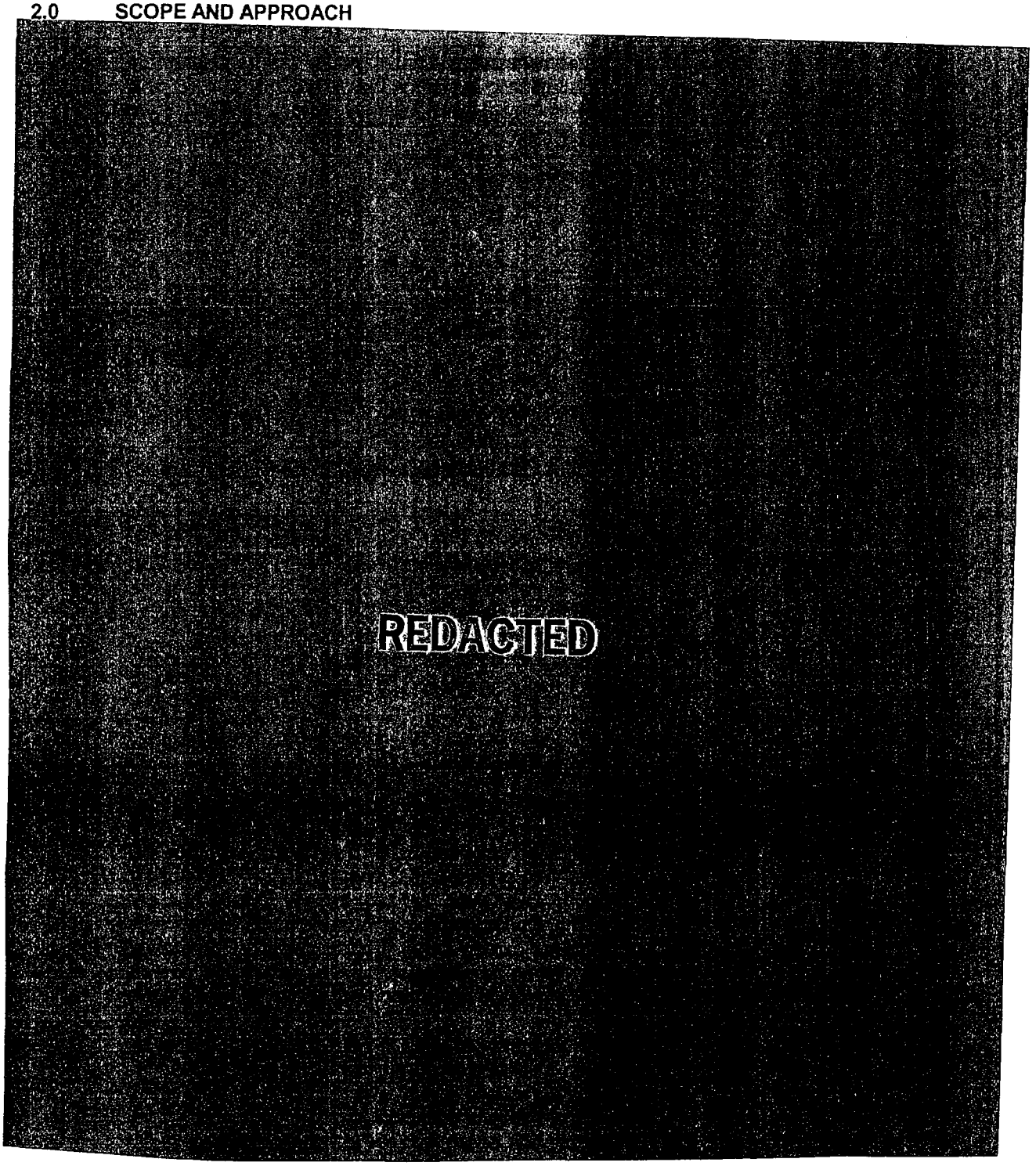
2.0 SCOPE AND APPROACH



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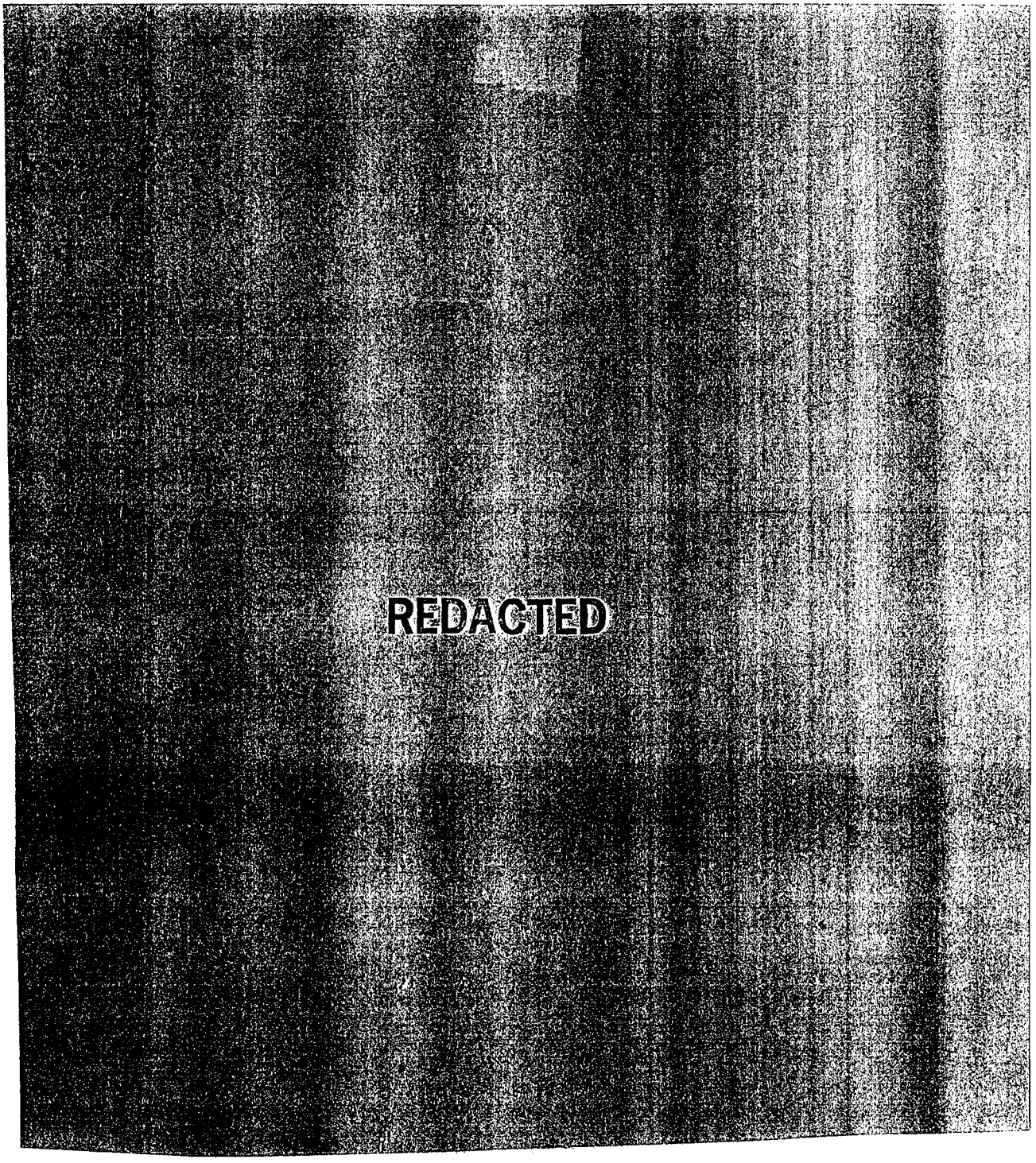

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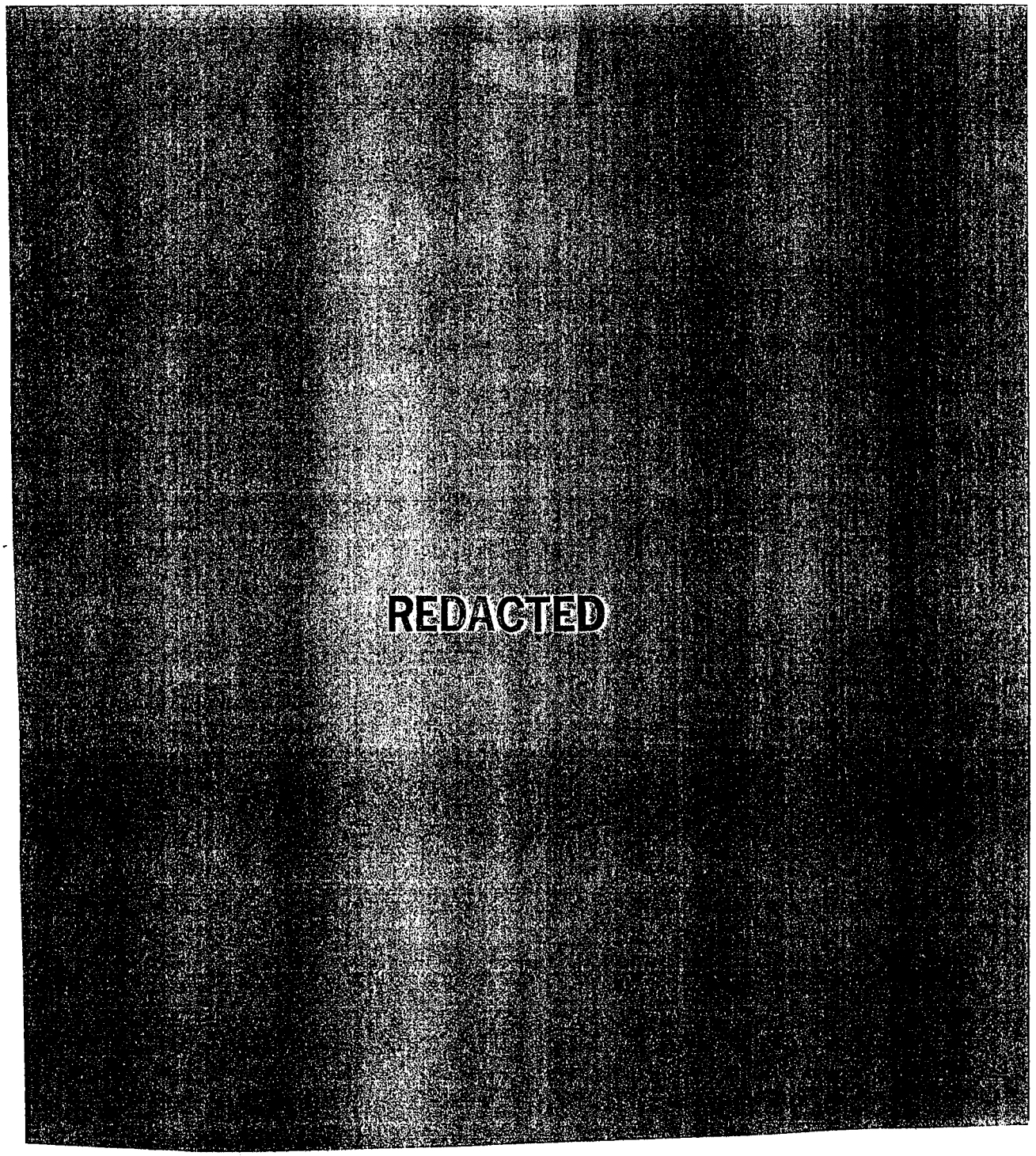

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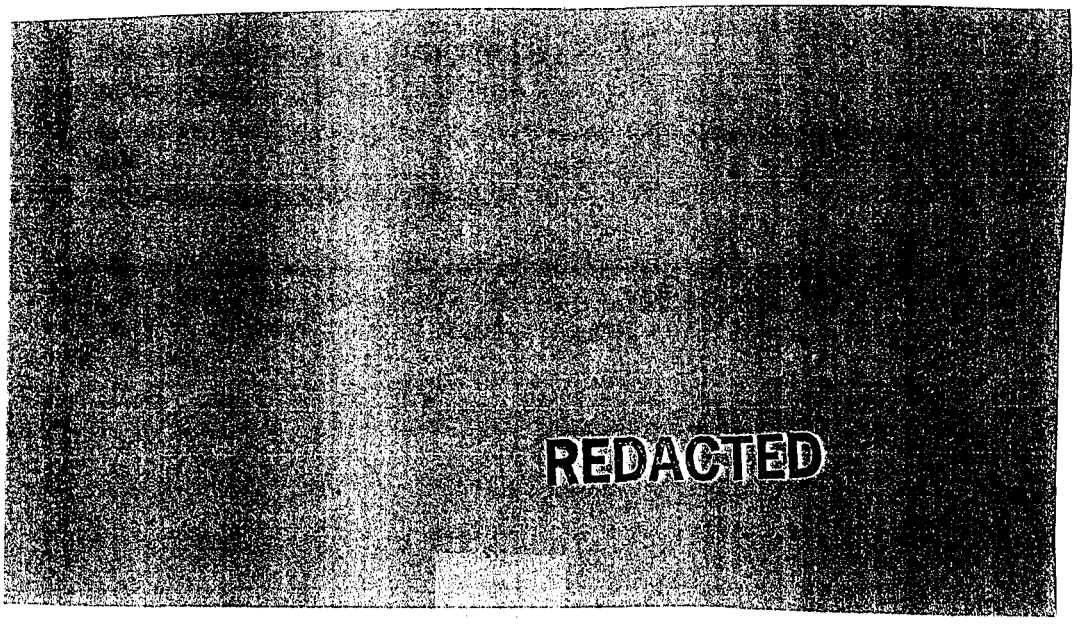

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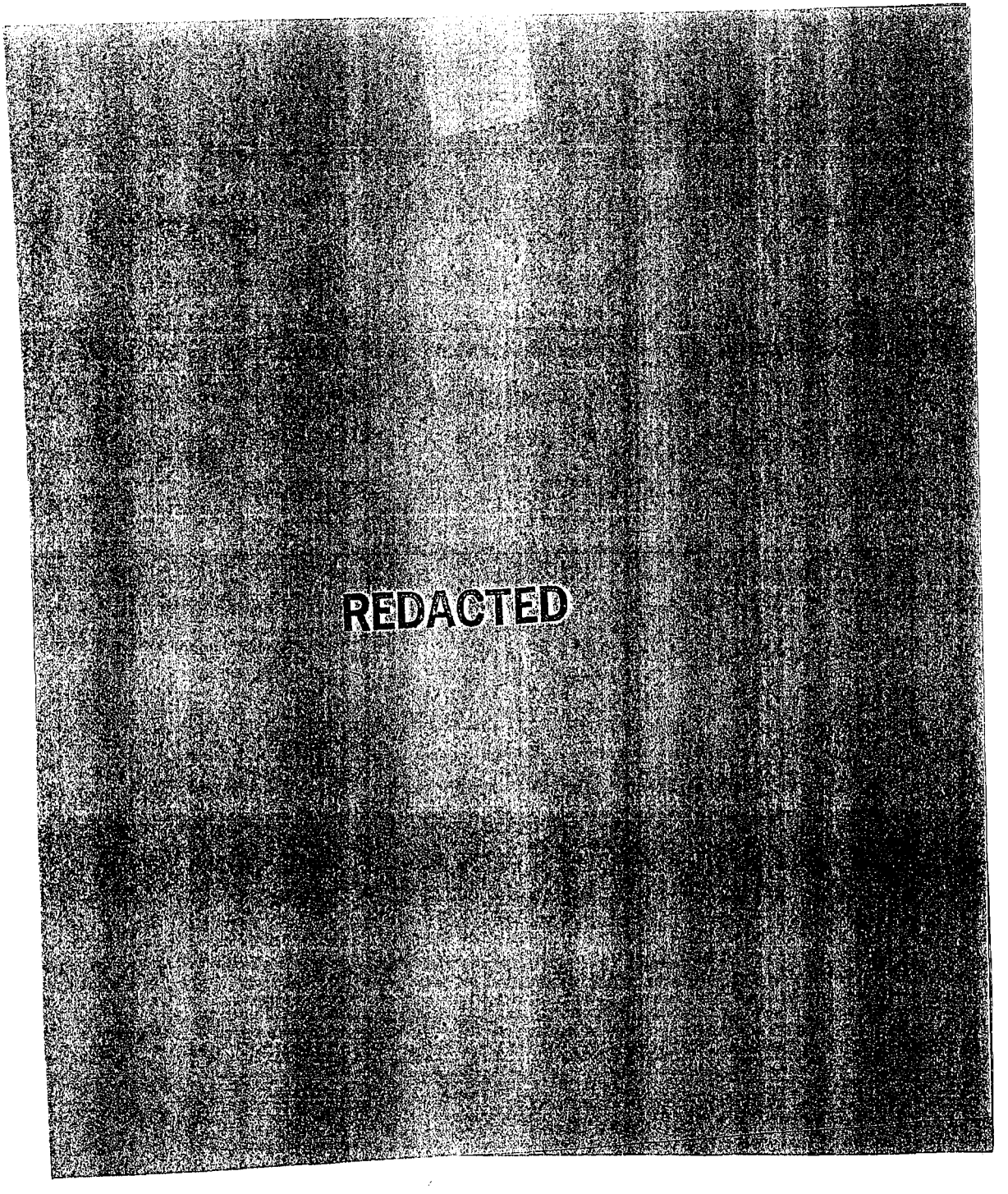

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PROJECT SCHEDULE

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PROJECT TEAM AND STAFFING

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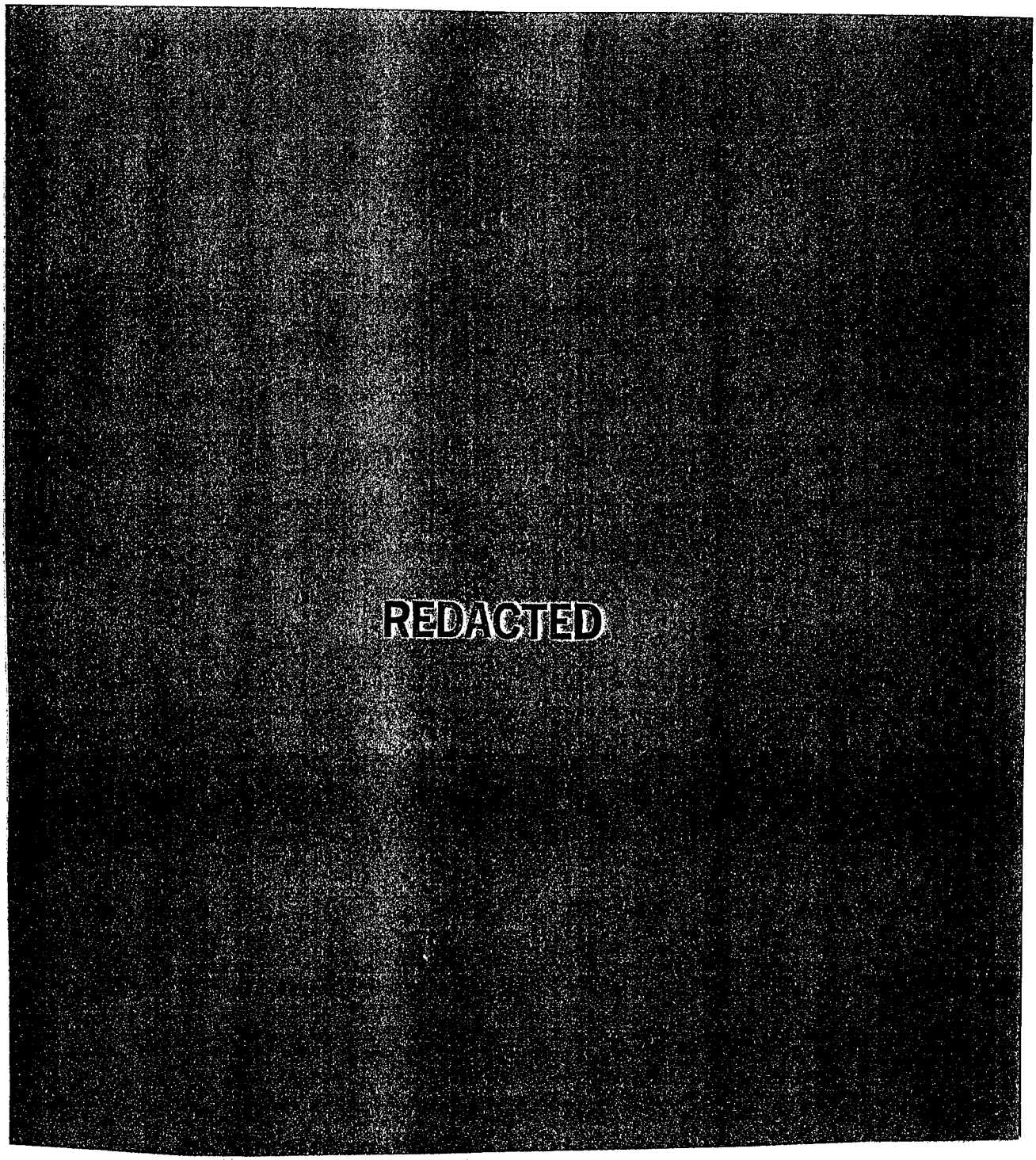
PROJECT TEAM AND STAFFING



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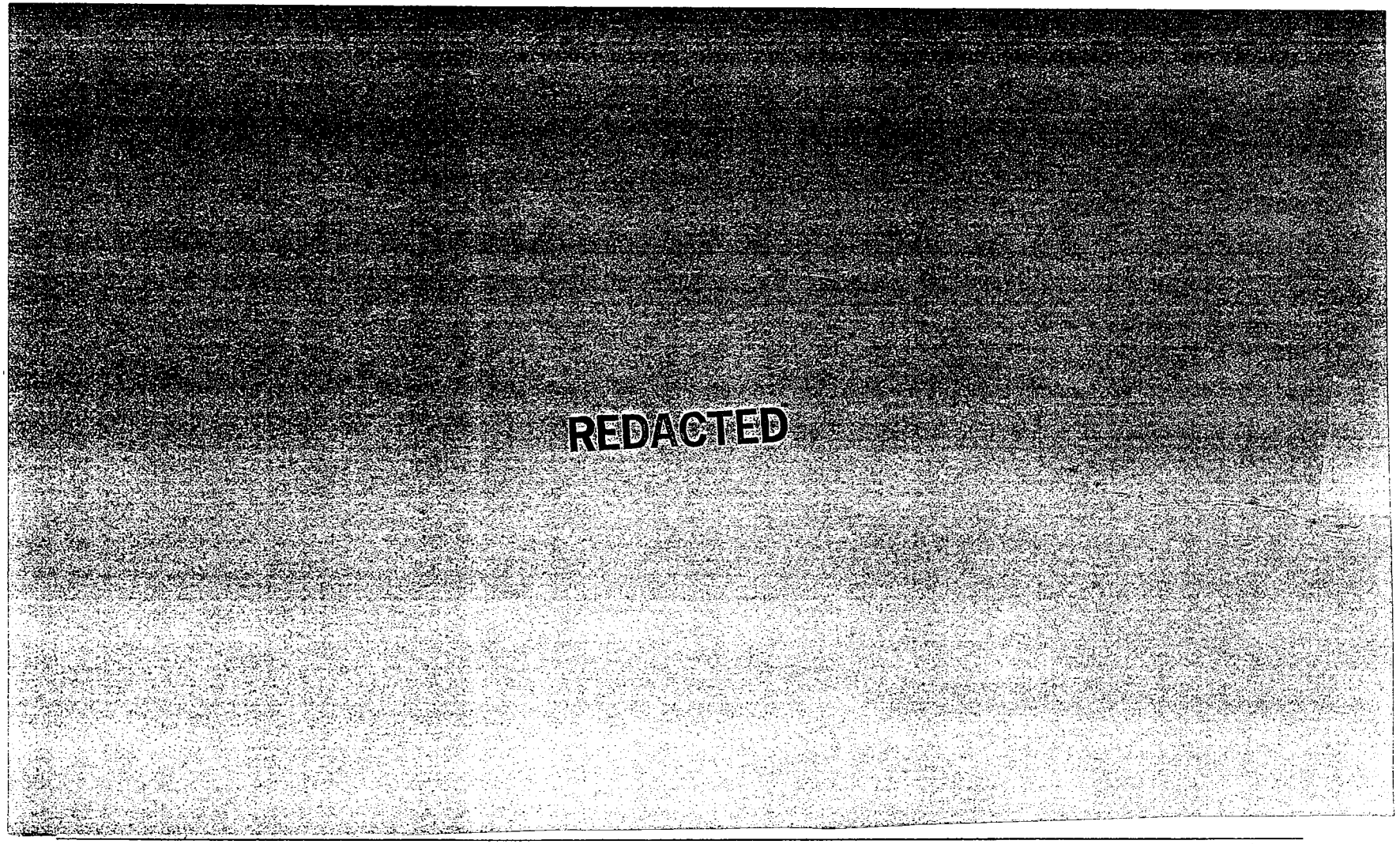

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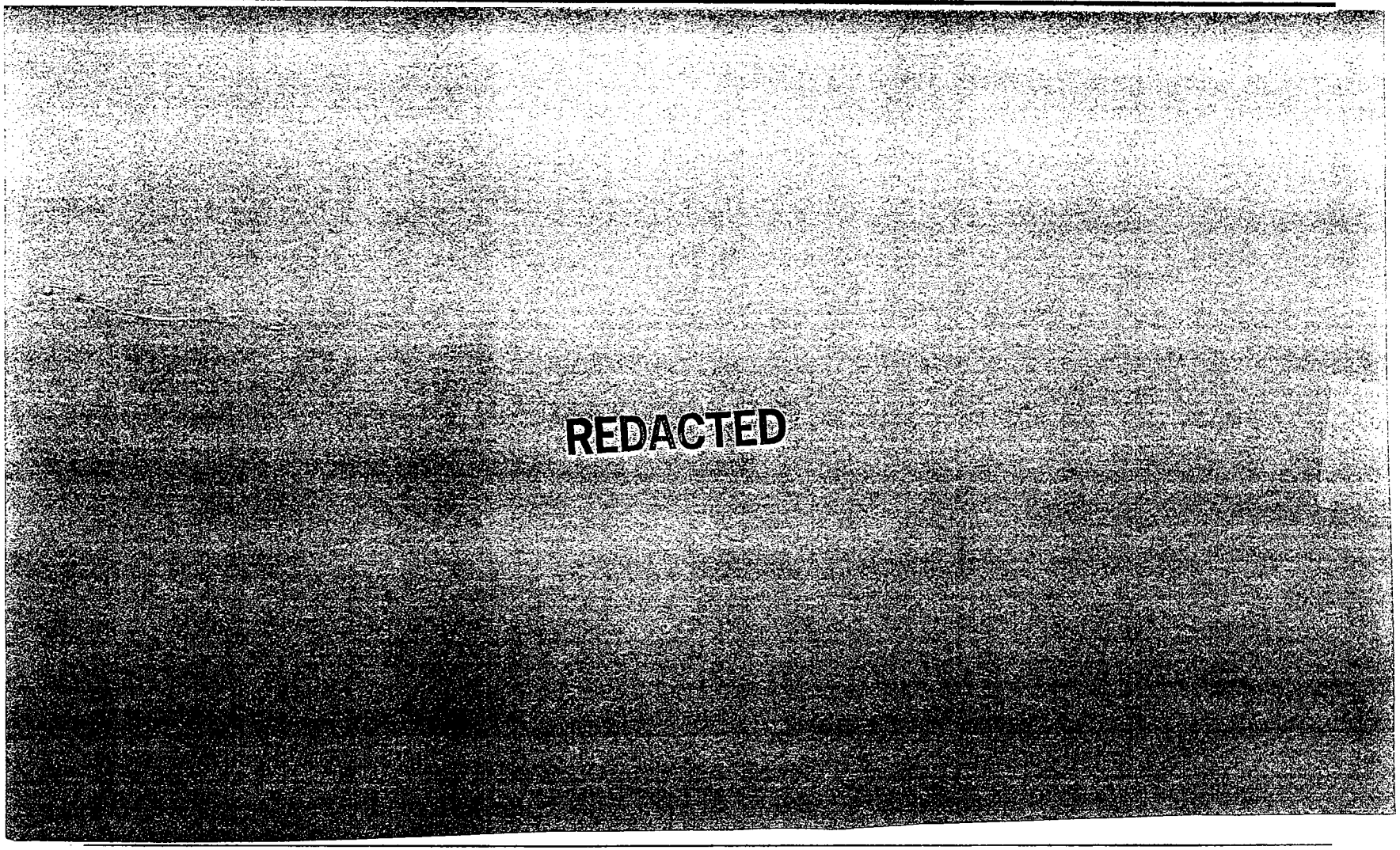

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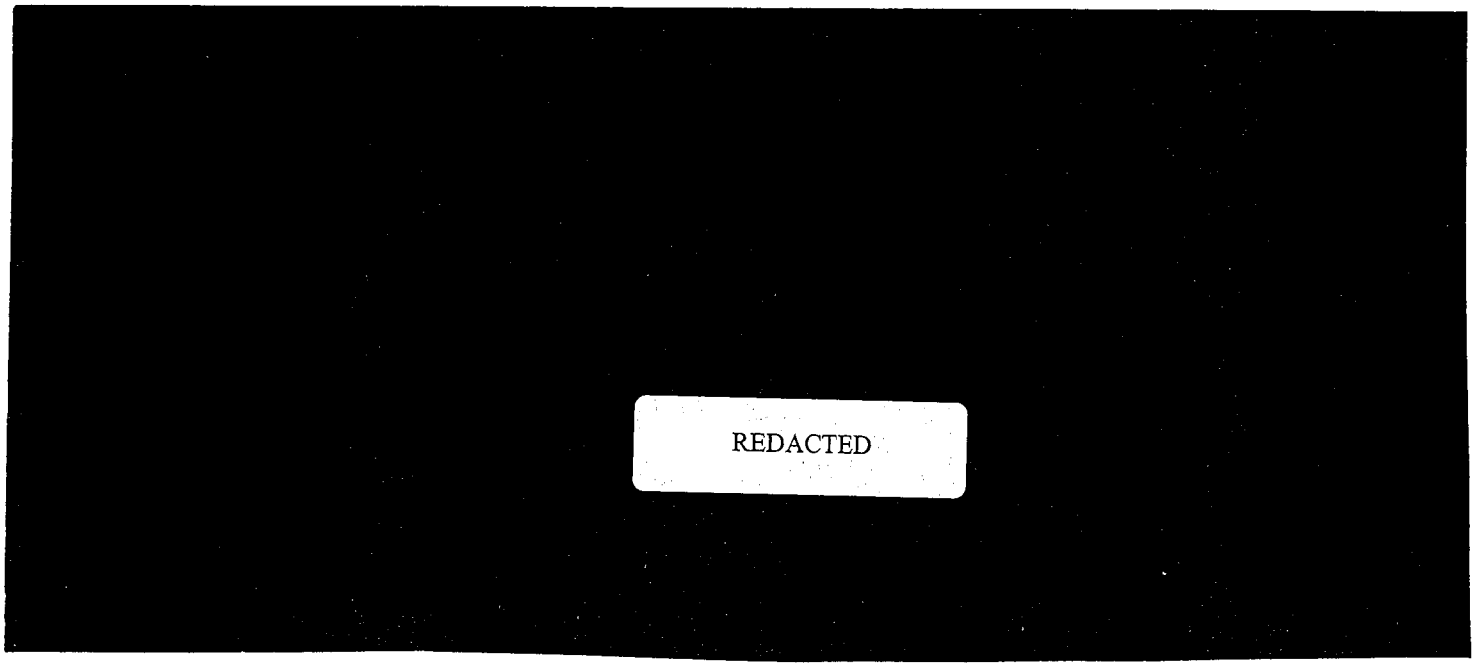
EXHIBITS



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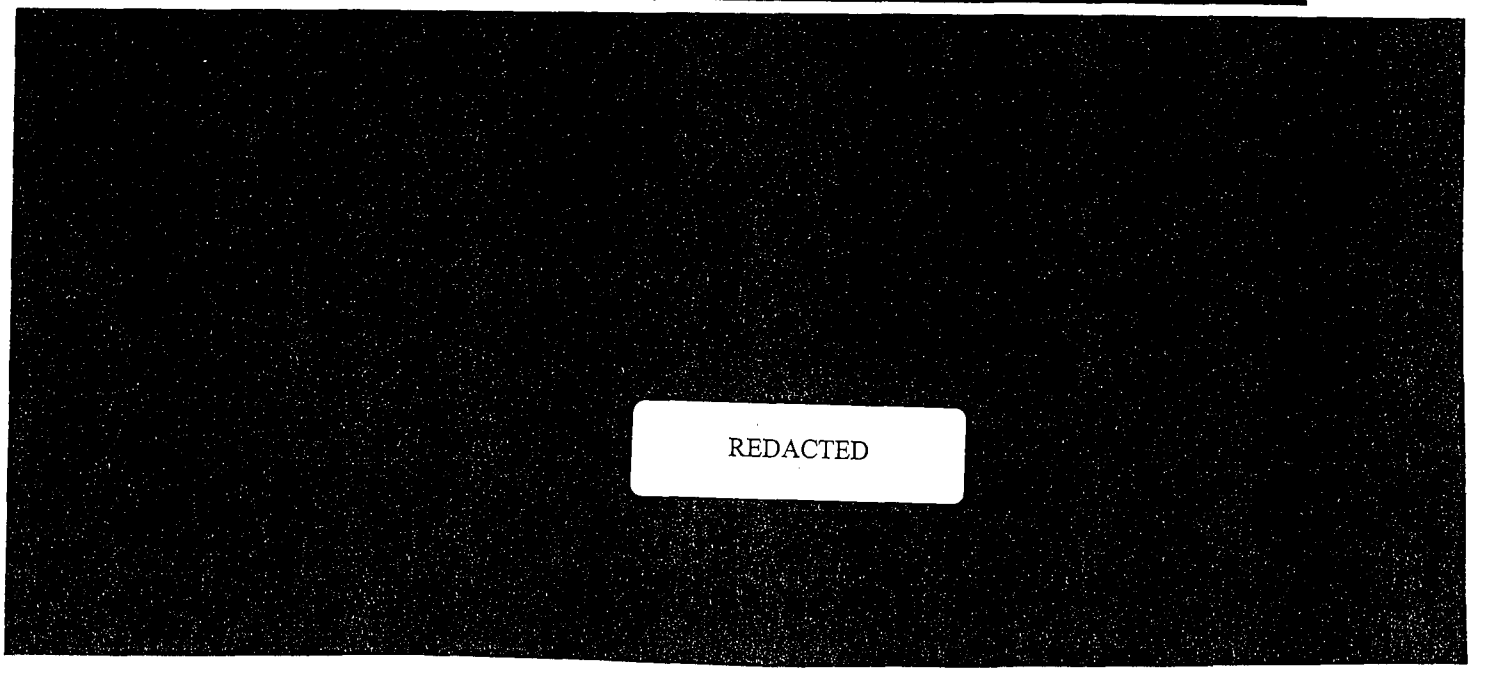
PEPSE Diagrams



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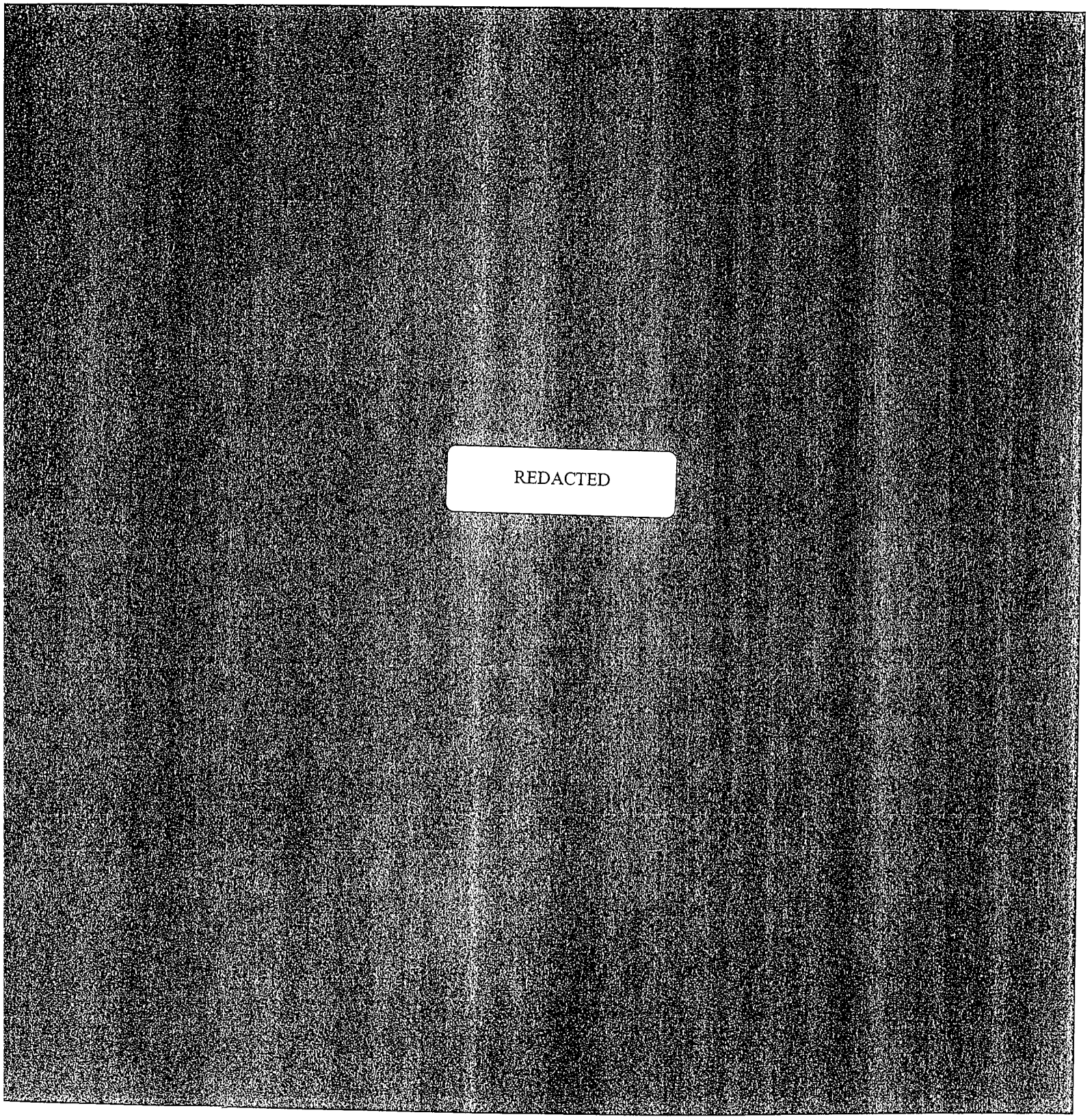

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