Westinghouse Columbia Plant

NRC and Westinghouse Management
Licensee Performance Review Update

October 21, 2004

Agenda

- Maintaining and Measuring Overall Success
- Progress since the August 18th, 2003 Management Meeting in Atlanta
  - –Corrective Action Status
  - –How are we measuring success?
- Progress since the June 3rd, 2004 Pre-Decisional Enforcement Conference for the Incinerator Event
- Long Term Corrective Action Completion since the Conversion PLC Event

Agenda (continued)

- Human Performance Program Status
  - –Procedure Use and Adherence Culture Change
    - ▪Clear Expectations
    - ▪Effective Procedures
    - ▪Training
    - ▪Qualification and Certification
    - ▪HuP Error Reduction
    - ▪Effective Reinforcement

Agenda (continued)

- NCS Program Status
  - –ISA Results
  - –August 2004 Extensive NCS Program Audit Scope: A Description of What We Did
  - –Results of NCS Audits and Planned Actions
    - ▪NCS Program Audit
    - ▪WSMS Audit of CSA's and CSE's

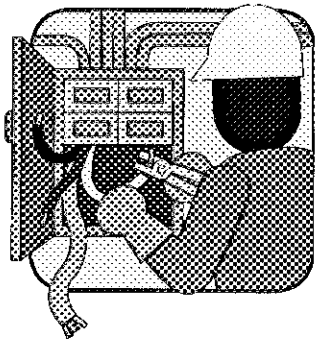
Agenda (continued)

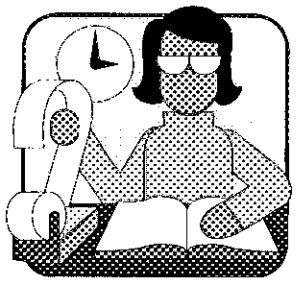
- A Discussion of CFFF Management Systems
  - –Implementation of Management Controls to Identify and correct program weaknesses
  - –Enhancement of Change Control Processes, e.g., CCF's and Procedures

Maintaining and Measuring Overall Success

Columbia Plant
Commitment to Improvement

The Columbia Plant Has Four Basic Priorities ...

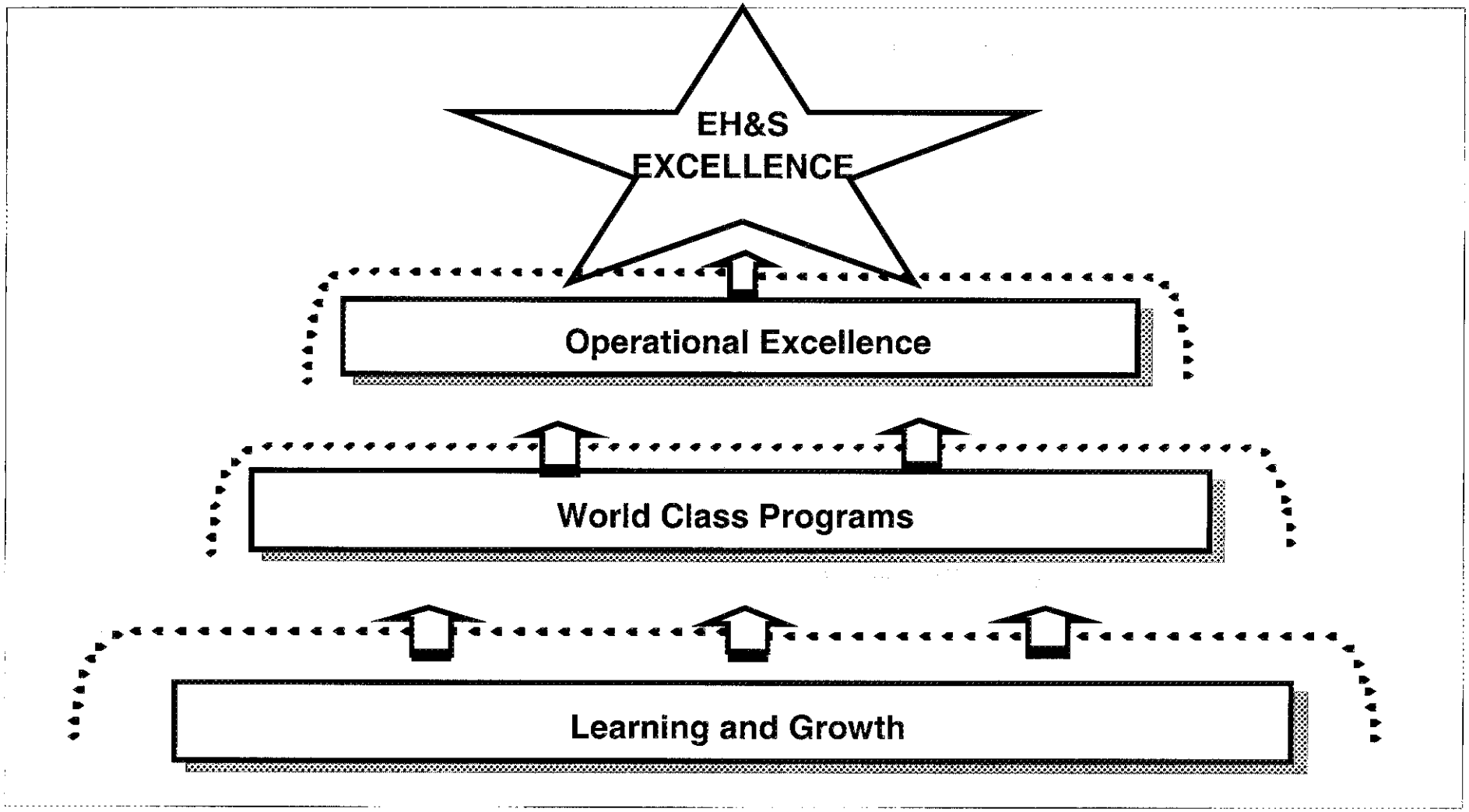




Maintaining and Measuring Overall Success

Westinghouse Columbia Plant Management Has An Aggressive Strategic Plan for EH&S Improvement Activities.

Columbia Plant EH&S Strategic Plan

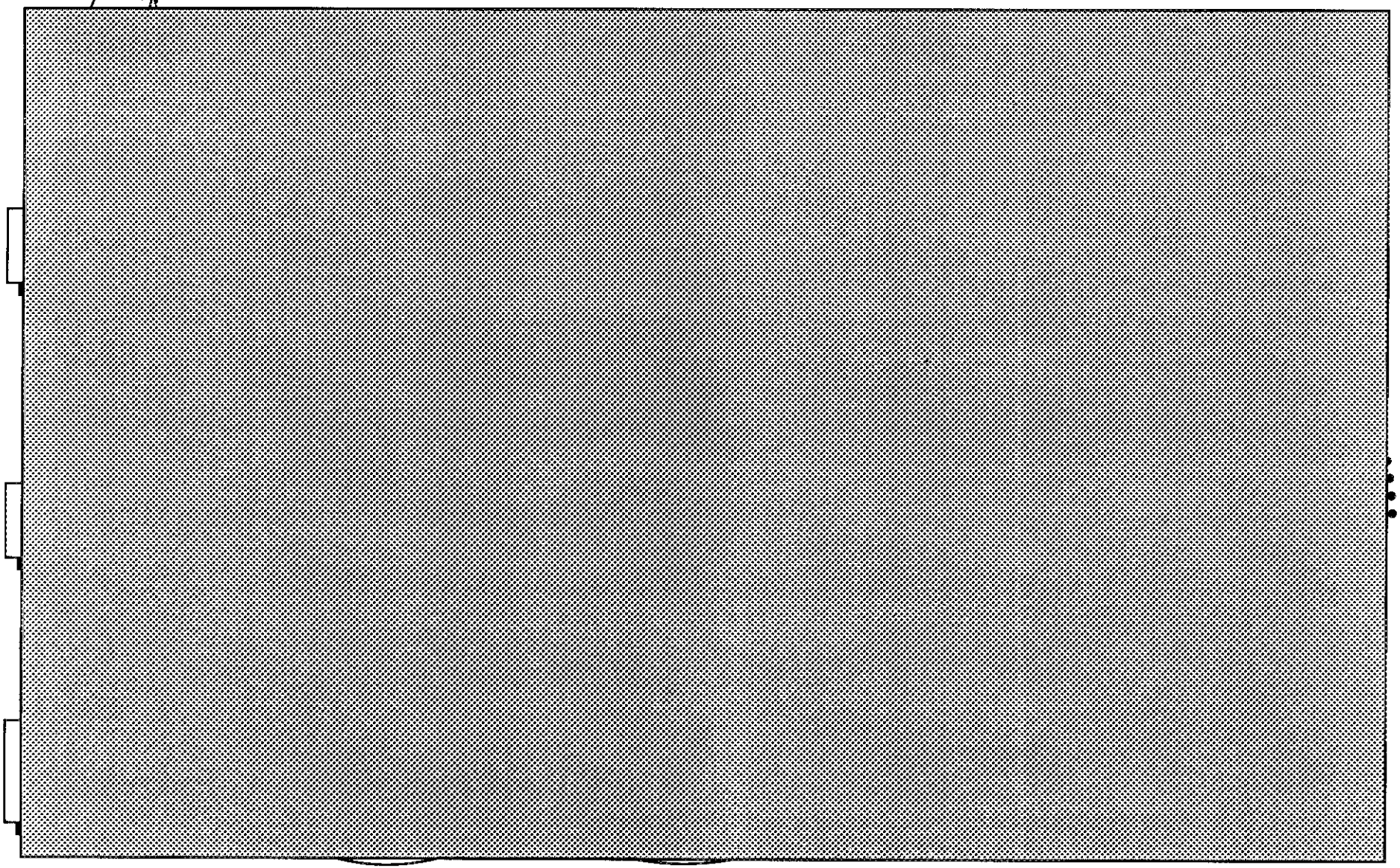


Commercial information to be withheld from public information in accordance with 2.390

EH&S Improvement Strategic Objectives

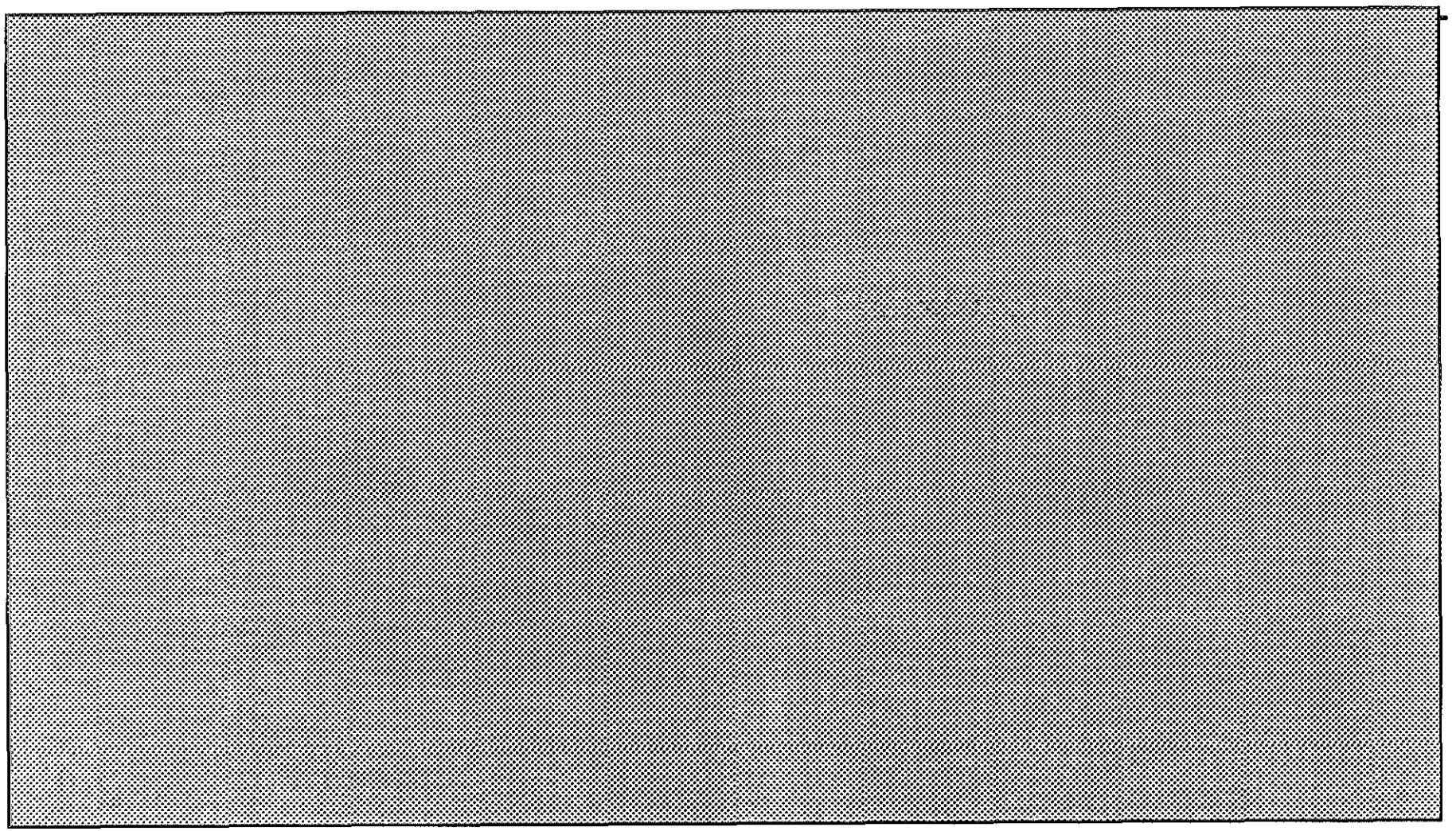
Rev 1
July 2003

Why



Commercial information to be withheld from public information in accordance with 2.390

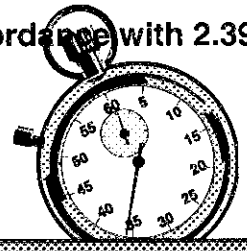
Columbia EH&S Metrics & Performance Expectations

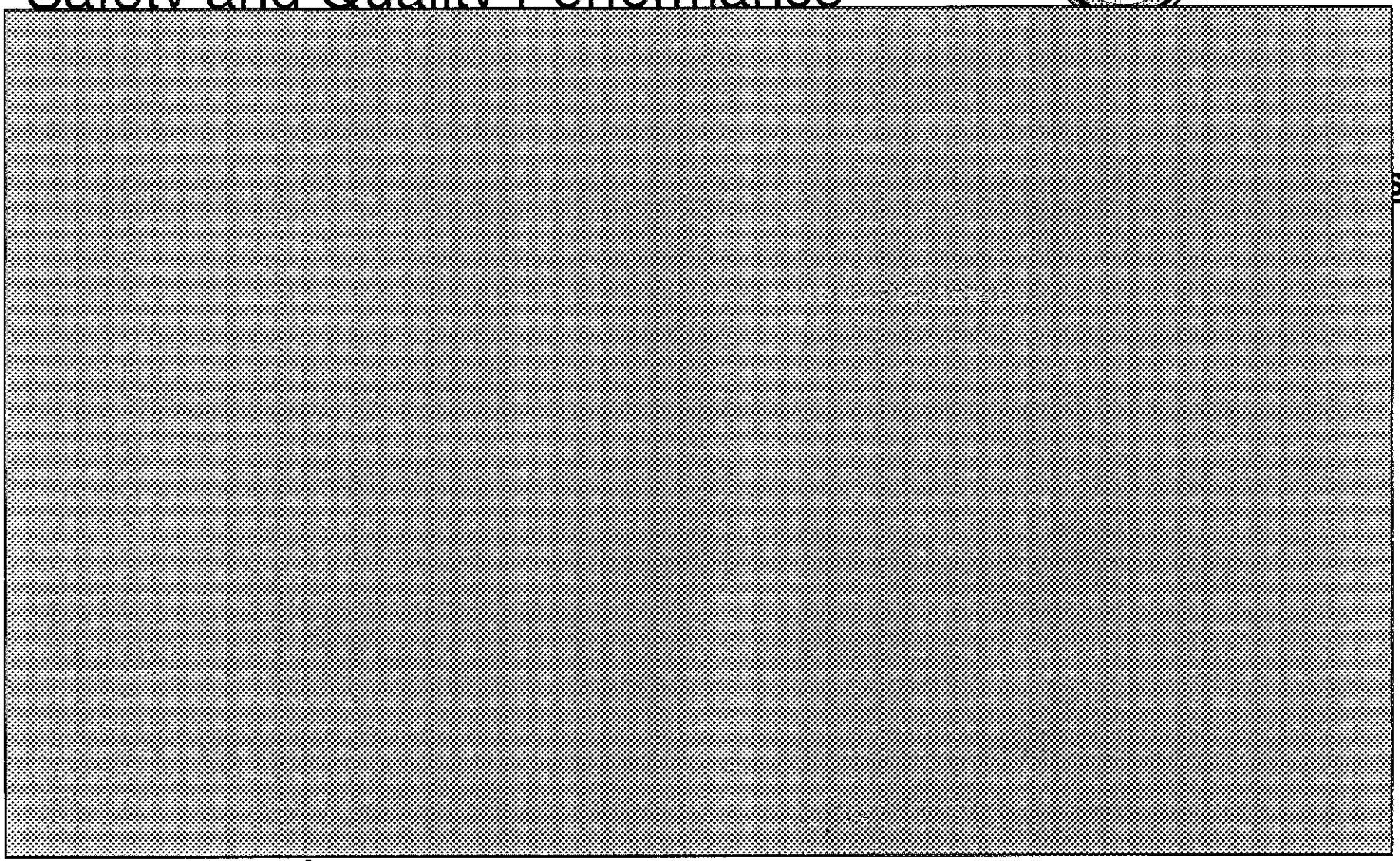


Commercial information to be withheld from public information in accordance with 2.390

Columbia Plant Event Clock

Safety and Quality Performance





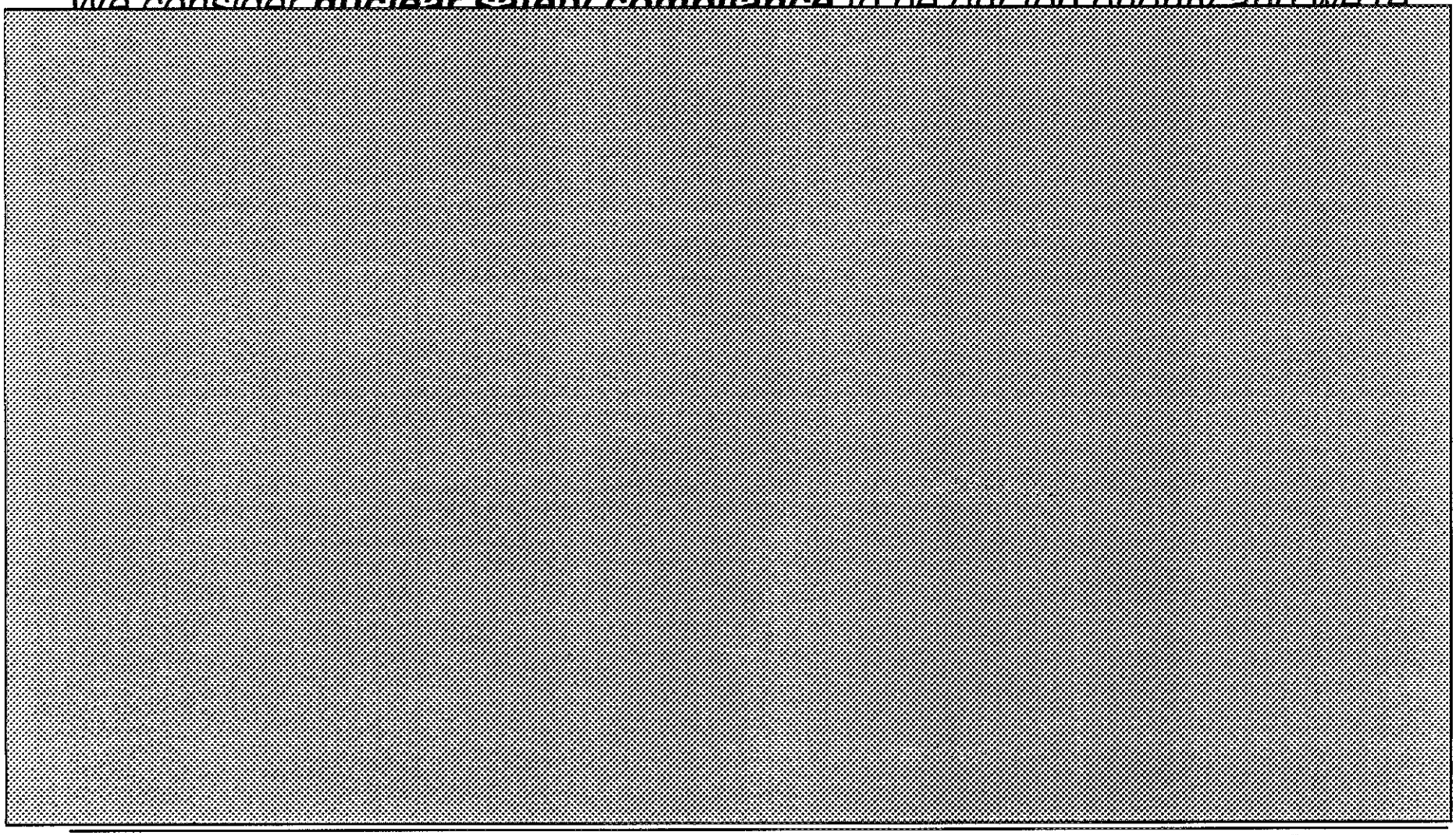
SS

hours

Columbia Plant Event Clock

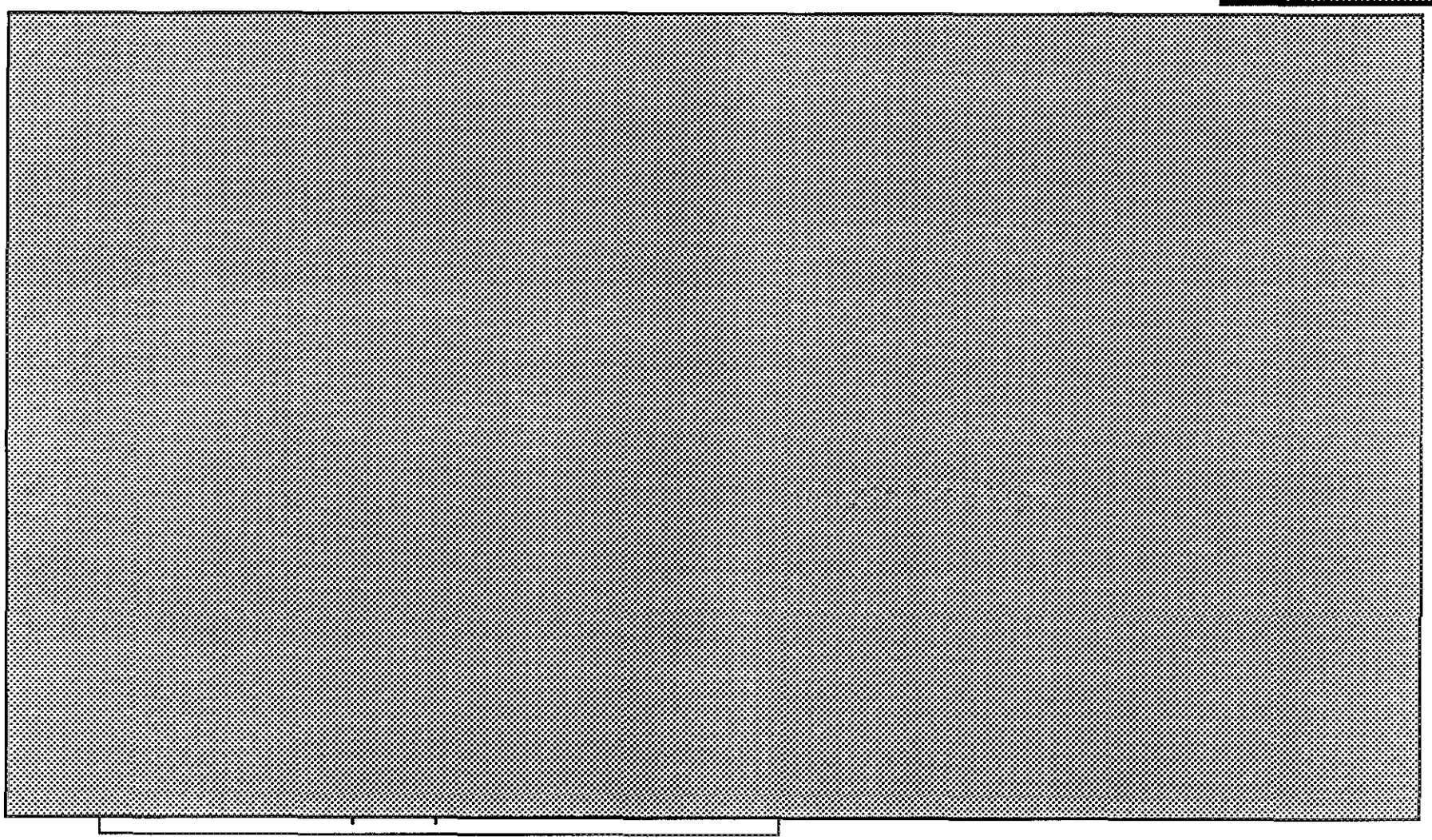
Safety -- Background Data

*We consider **nuclear safety compliance** to be our top priority and we're*



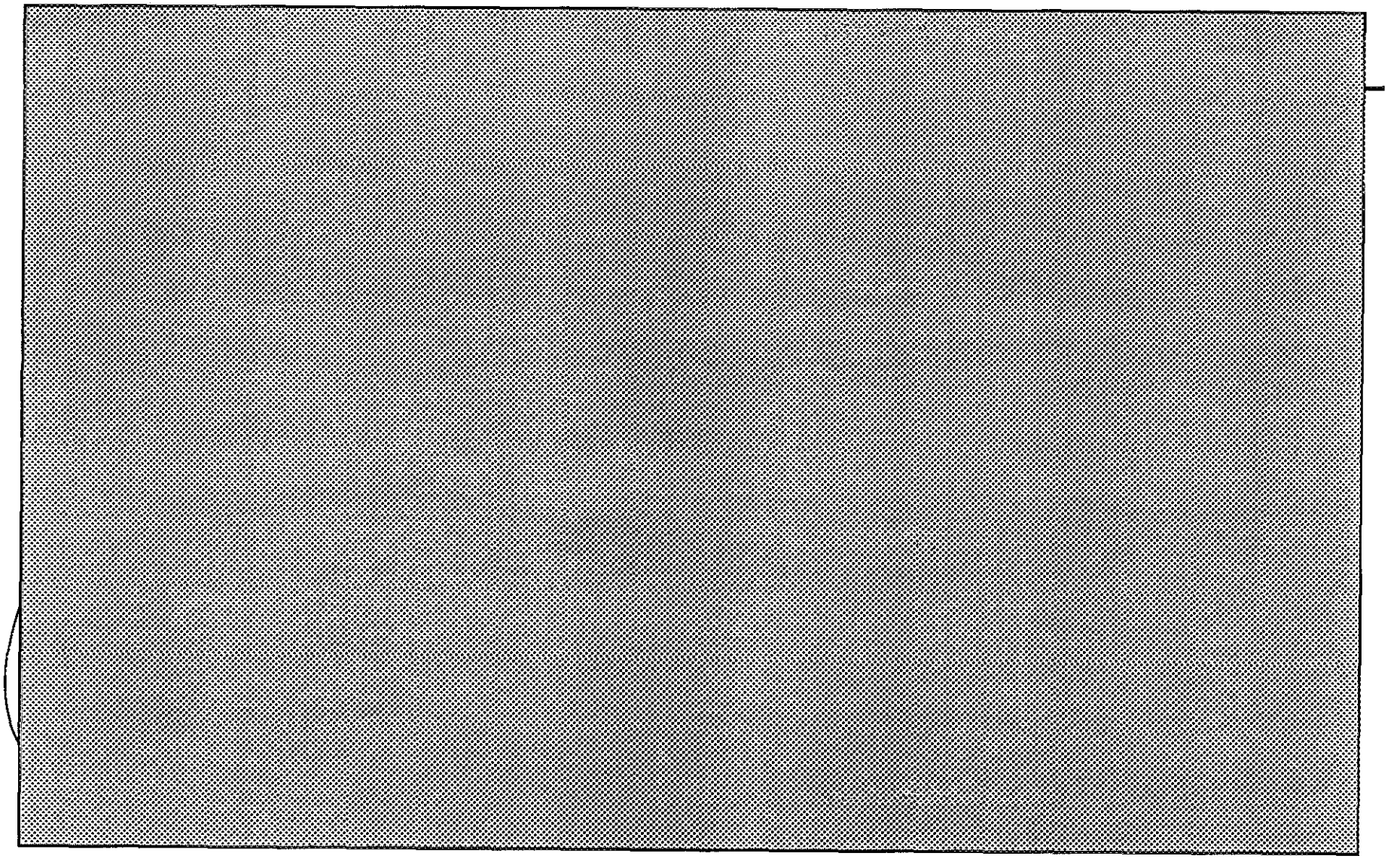
Columbia Plant

NRC Notices of Violations



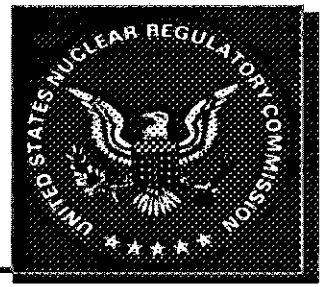
Commercial information to be withheld from public information in accordance with 2.390

Columbia Plant



Columbia Plant

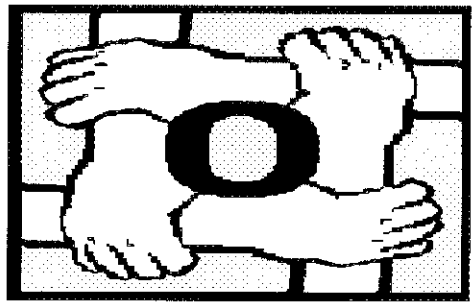
Formal Regulatory Feedback



- NRC biennial review period includes 2002-2003
- Overall conclusion => we are operating our plant safely and securely
- NRC surveillance identified adequate regulatory performance in most areas
  - safeguards (SNM control & accounting, physical protection)
  - radiological controls (environmental protection, rad protection, waste management, transport)
  - facility support (maintenance, training, emergency preparedness and management org/controls)
- Procedural adherence identified as a clear area for strengthening
  - Supervisors and managers ensuring procedural compliance in all activities

Westinghouse Is Fully Committed To Achieving World Class Safety And Regulatory Compliance In All Columbia Plant Operations.

Working Together



The Target is Zero

We believe that if we satisfy ourselves, we will satisfy our regulators and our customers.

Progress since the August 18th, 2003 Management Meeting in Atlanta

NRC Region II Mtg. Agenda
August 18, 2003

- Overview of recent 91-01 events
  - Root Cause determinations
  - Interim corrective actions
  - Long-term corrective actions
- Management oversight and control issues
  - Procedure compliance - a status report
  - Uranium Recycle & Recovery Services Area
- Summary Comments

Status of 2003 URRS SOI Event

- Event 1: In July 2003, a process engineer wrote an Supplemental Operating Instruction (SOI) to assess burial of HEPA filters (HEPA filters were to be compacted and assayed); the engineer failed to recognize the potential for nuclear criticality safety impact and did not include Nuclear Criticality Safety (NCS) in the SOI review; this temporary process change was outside of NCS analyzed parameters and resulted in a 91-01 notification.

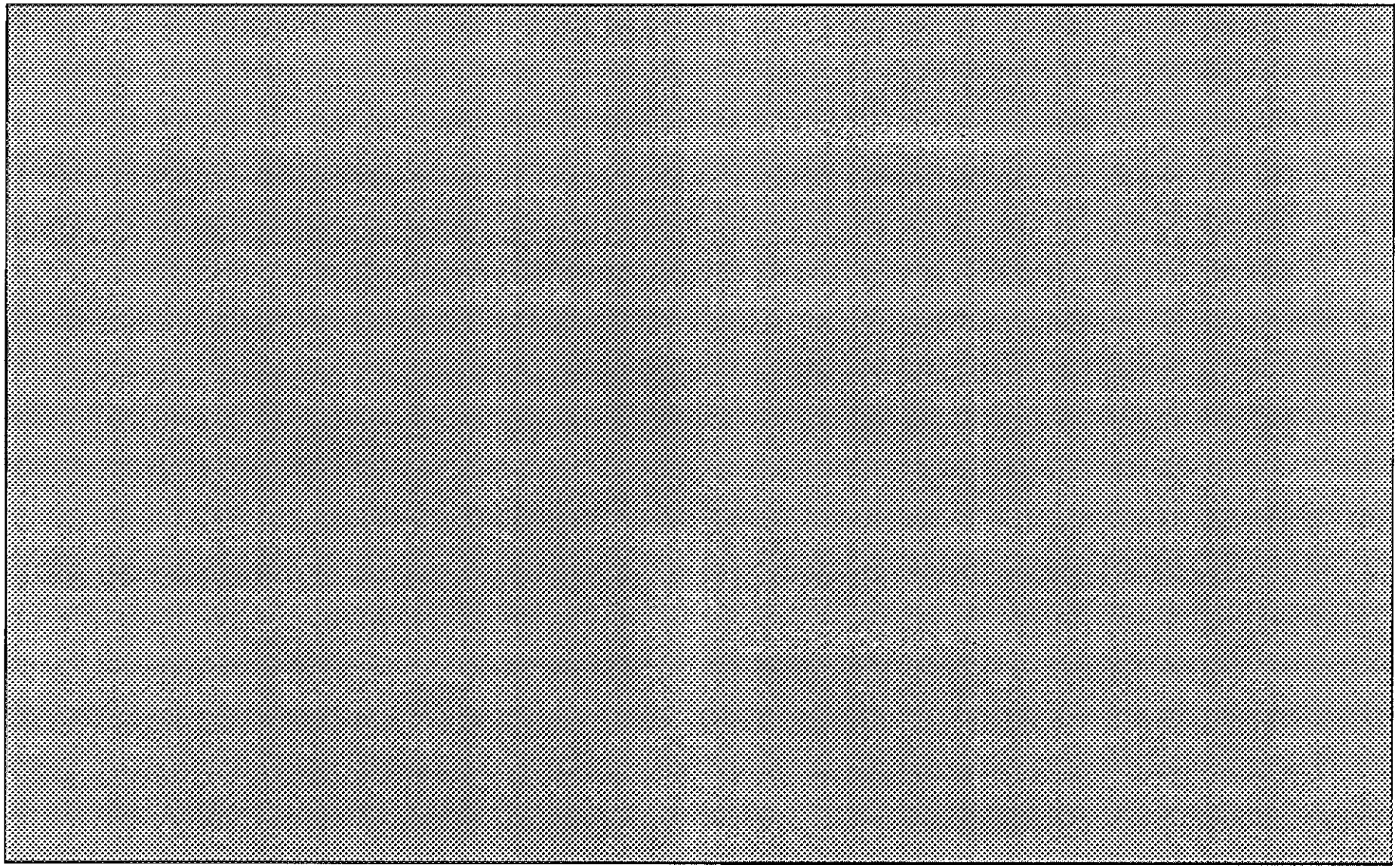
Status of 2003 URRS SOI Event (cont.)

- Effective corrective actions were taken to prevent recurrence of similar events involving SOI's.
  - –The SOI approval process was enhanced to be consistent with the procedure and configuration control management systems.
  - –Management addressed the personal performance aspect of the event.
  - –EH&S has performed focused auditing of URRS activities to identify weaknesses and resolve same.

There have been no repeat events involving SOI's.

Commercial information to be withheld from public information in accordance with 2.390

03-188-C004 **SOI-U-0115, Burial of Contaminated Air Filter Paper, violated Nuclear Criticality Safety (NCS) bounding assumptions of LLRW ISA for Compactor.**



Status of 2003 URRS UN Pump-Out Event

- Event 2: In July 2003, an unqualified operator responded to an alarm and inadvertently pumped out uranyl nitrate to a bulk storage tank without complete lab analysis results.

Status of 2003 URRS UN Pump-Out Event (cont.)

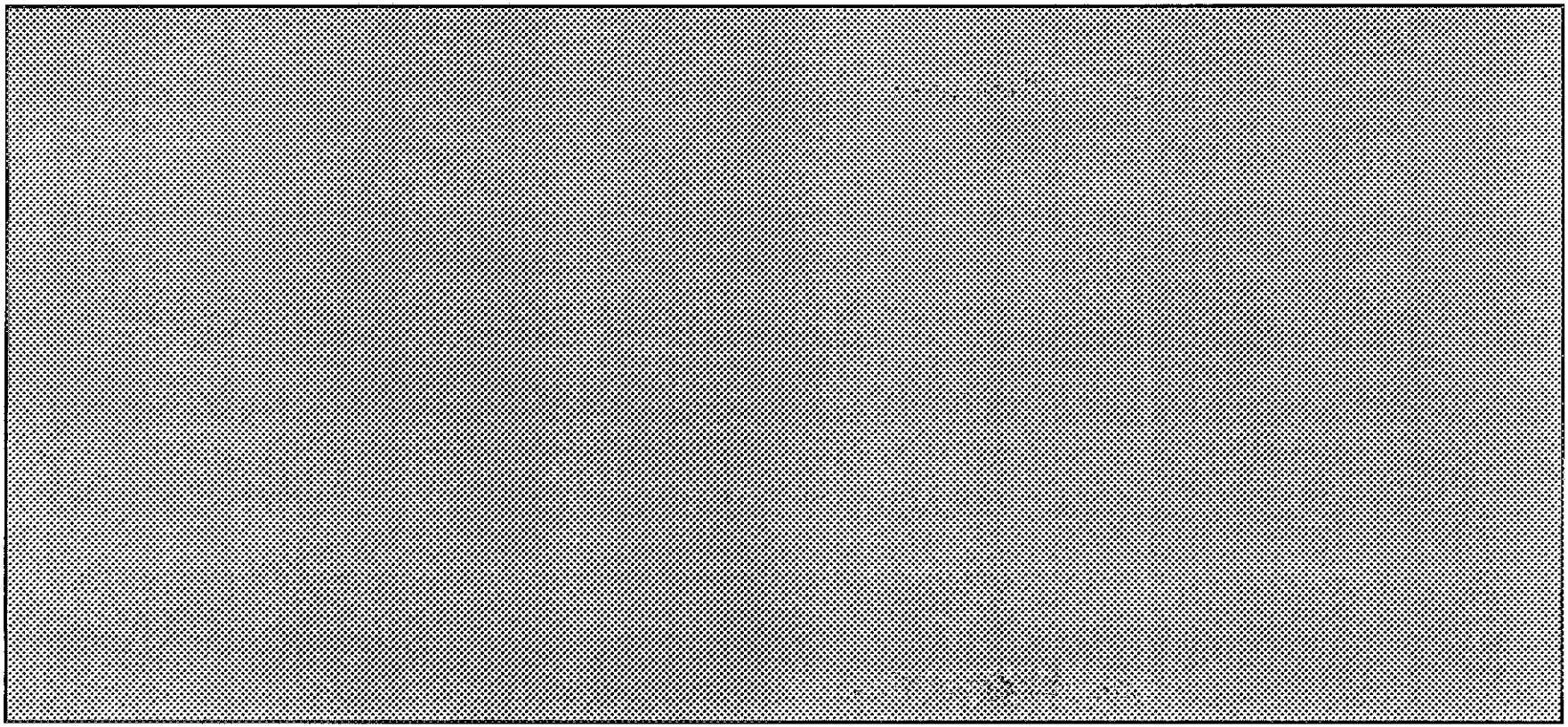
- Corrective actions were taken to prevent recurrence of similar events.
  - –URRS Operators have been recertified on UF6 Bay, Dissolver and SOLX processes.
  - –An administrative control was added requiring the team manager to control UN pump-outs.
  - –The operator responsible for the erroneous pump-outs has been disqualified as a SOLX operator.
- A repeat event occurred one year later in August 2004 when a team manager opened the wrong valve.

Status of 2003 URRS UN Pump-Out Event (cont.)

- Installation of a more robust design control was subsequently accelerated to prevent recurrence (the design had been completed and was awaiting an installation window)
  - –A total of 18 automatic control valves were installed to prevent recurrence of erroneous pump-outs to the UN Bulk Storage System.
  - –The UN Bulk Storage tank inlet valves will not open unless analytical results for % free acid, pH and $\%U_{235}$ are within acceptable limits.
  - –This engineered fix is intended to eliminate the potential for human error by URRS operations personnel and prevent recurrence of similar events.

Commercial information to be withheld from public information in accordance with 2.390

03-202- C001 **Discharge of Uranyl Nitrate prior to completion of analytical results.**



The engineered fix that was installed in August 2004 was designed following the 2003 event. It was waiting a planned Production window at the time of the 2004 event.

Status of URRS Management System Improvements

- The URRS management structure was reorganized.
  - –A dedicated URRS Manager with a strong safety/compliance orientation was appointed.
  - –Changes in Team Manager assignments were made to support the restructuring.
- Human Performance Improvements are being aggressively implemented in URRS to minimize the frequency and severity of events and to improve the compliance focus.

URRS Performance Summary

- In Calendar Year 2004, there have been no NRC violations or criticality safety notifications in URRS that were the result of hourly employee activities.
- In Calendar Year 2003, over half of the NRC violations and criticality safety notifications were URRS hourly employee driven.
- URRS employee and overall performance will continue to be monitored to ensure improvements are sustained.

The actions discussed at the August 2003 Management Meeting were completed and have resulted in positive change.

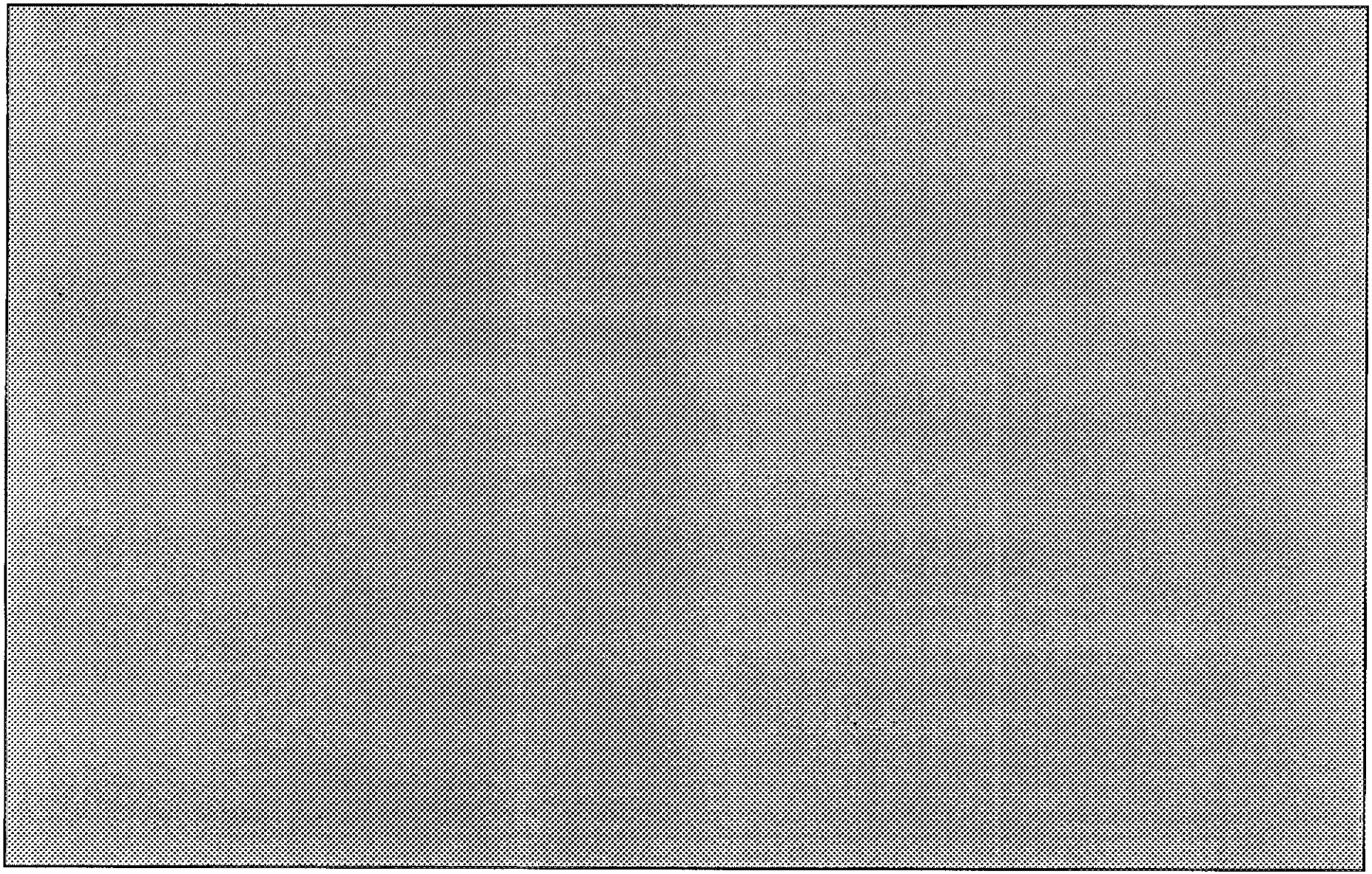
Progress since the June 3rd, 2004 Pre-Decisional Enforcement Conference for the Incinerator Event

CFFF Investigations and Root Cause Determinations

- The Root Cause Analysis and Management Reviews Identified Corrective Actions In the Following Areas Based on the Determined Causal Factors for the Incinerator Event:
  - Training and Qualification of Process Engineering Personnel Involved in the Integrated Safety Analysis Process
  - Communication Between Work Groups: Nuclear Criticality Safety, Material Control and Accounting, and Process Engineering Personnel
  - Nuclear Criticality Safety Analysis Program
  - Design Verification Process Improvement
  - Incinerator System Design Modifications

Commercial information to be withheld from public information in accordance with 2.390

04-064-C008 Incinerator Ash Concentration and Off-Gas System Carryover



ISA Expectations for Process Engineers

- We are changing the behaviors of area managers and process engineers so that they have ownership and working knowledge of their design safety basis documentation
  - –We are currently creating a reinforcement plan to create this culture change.
- Process Engineers are responsible for ISA Chapters 1 through 5
  - –Process Description
  - –Process Theory
  - –Process Design and Equipment
  - –Drawings and Operating Procedures
  - –Process Safety Information (MSDS's)

Process Engineering and Operations ownership of their ISA's is a key focus area going forward.

Integrated Safety Analysis

CSA's
CSE's
PHA's

ISA
This includes process description, hazards, accident scenarios, and preventive measures

RA108 Sketches
Identify Hazards and Controls that Prevent Accidents

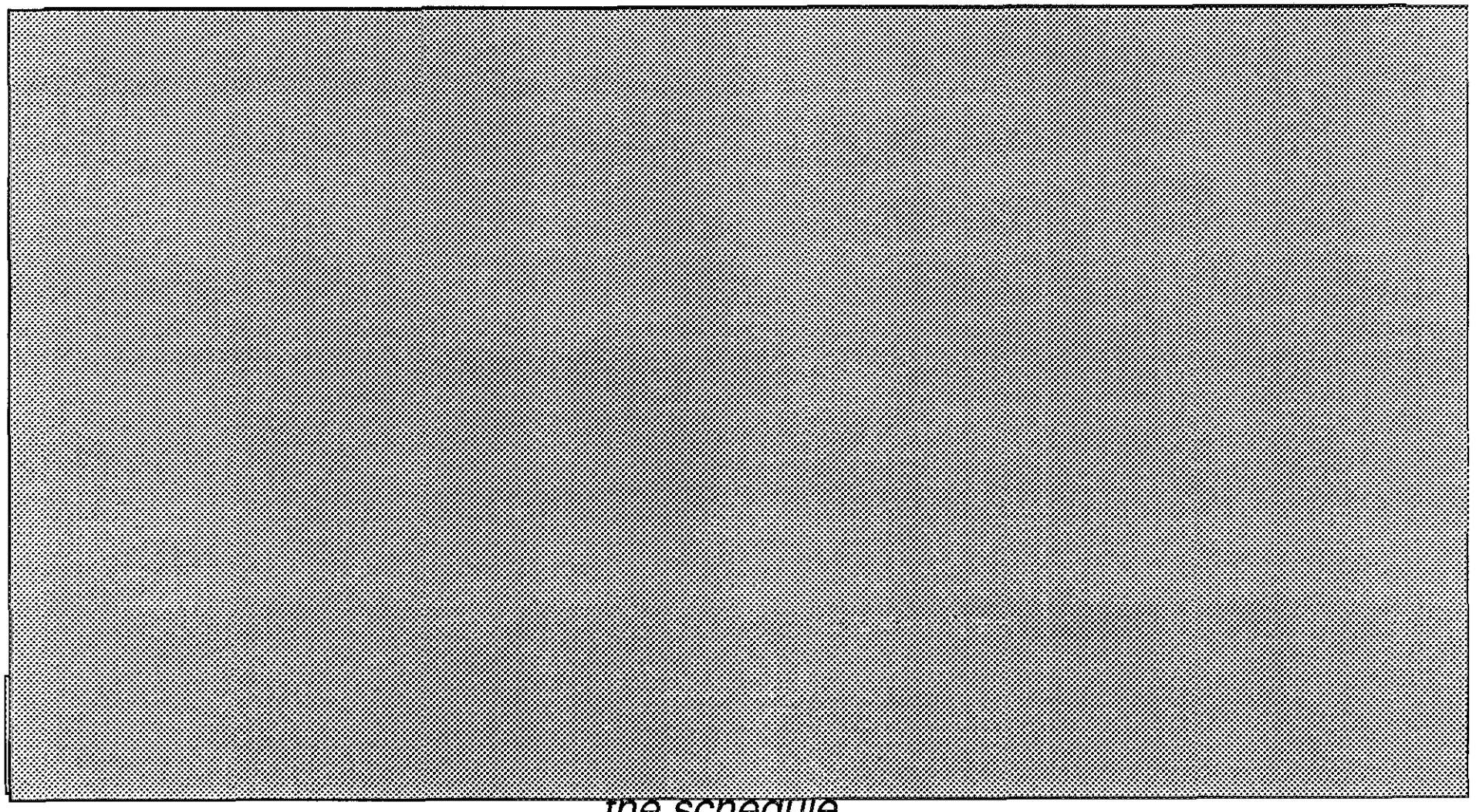
ISA Summary
This is a shortened version of the ISA that is submitted to the NRC

Procedures
Include Safety Significant Information from the Sketches

ANALYZED SPACE

Configuration Control Request
A request to change the process may take us out of analyzed space

Incinerator System Design Modification Status



the schedule.

Incinerator System Overall Status

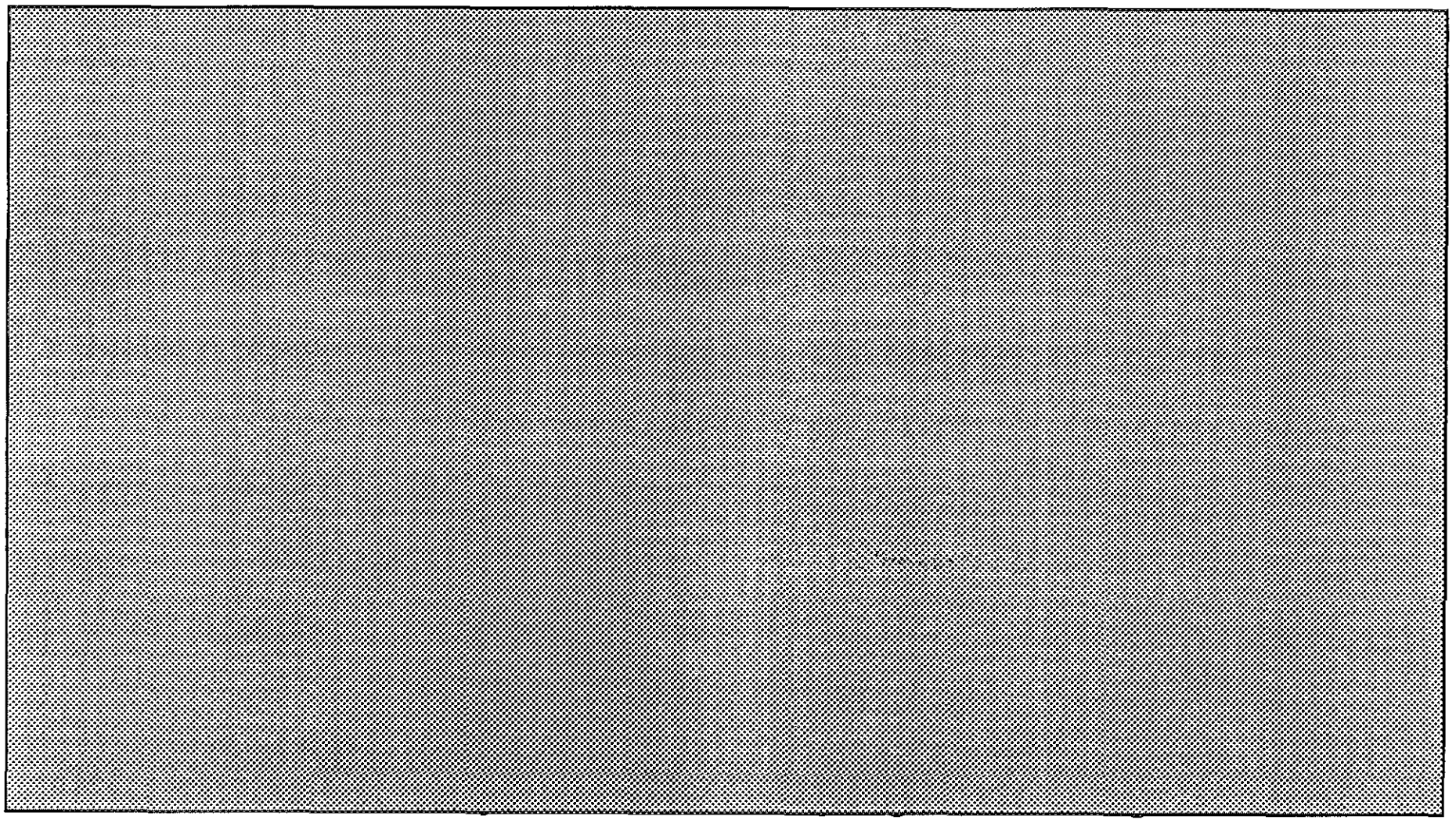
- Progress on the Incinerator Corrective Actions is being tracked through our formal corrective action system and is meeting Westinghouse Management expectations.

- The new robust incinerator design and the resulting nuclear criticality safety analysis will be approved by the NRC prior to restart (approximately August 2005)

- Improvements to the Nuclear Criticality Safety

Long Term Corrective Action Completion since the Conversion PLC Event

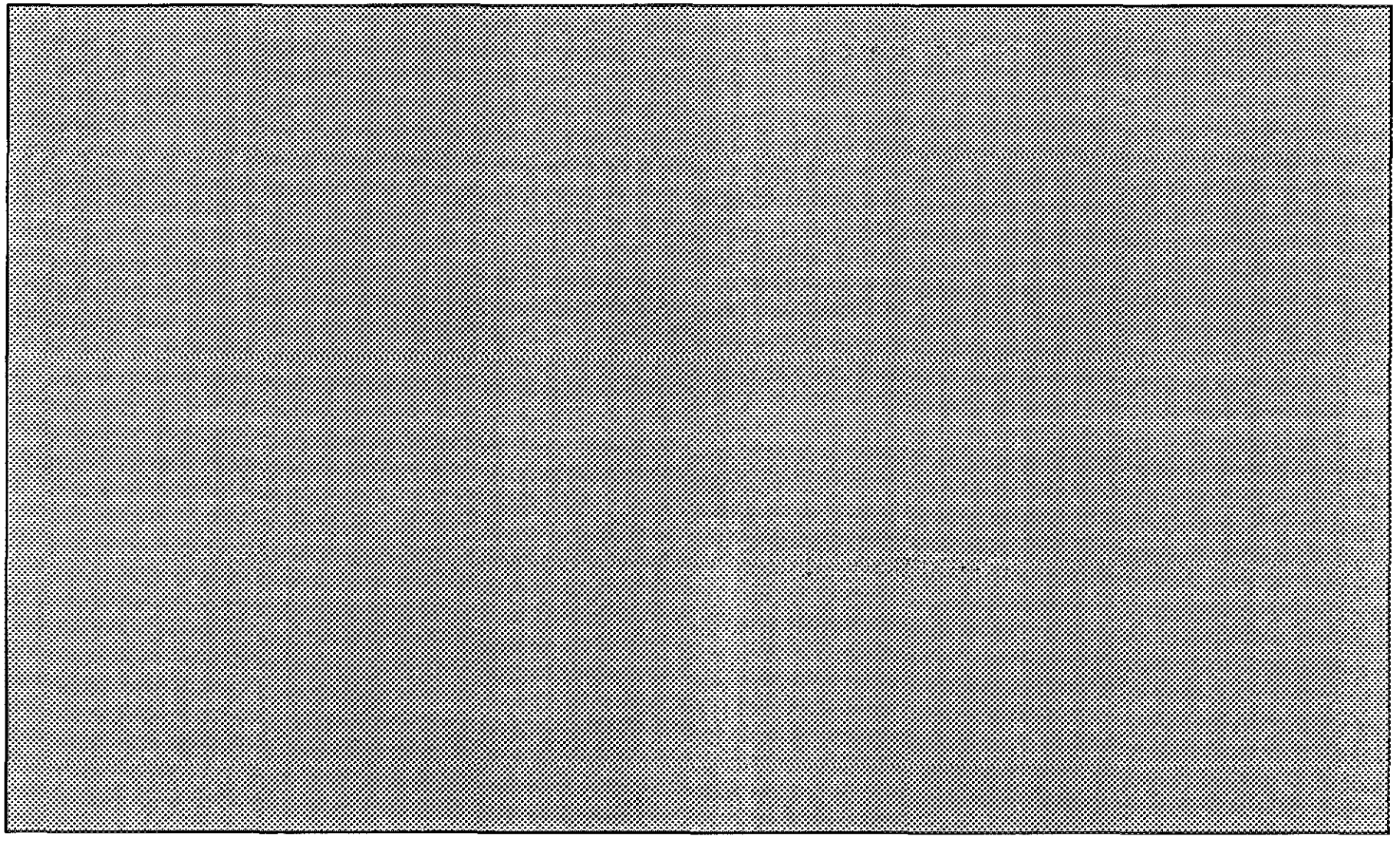
Long Term Corrective Action Completion for the 2001 Conversion PLC Event



according to the higher standards.

01-000980 **Lost all interlocks to Conversion Line 4**

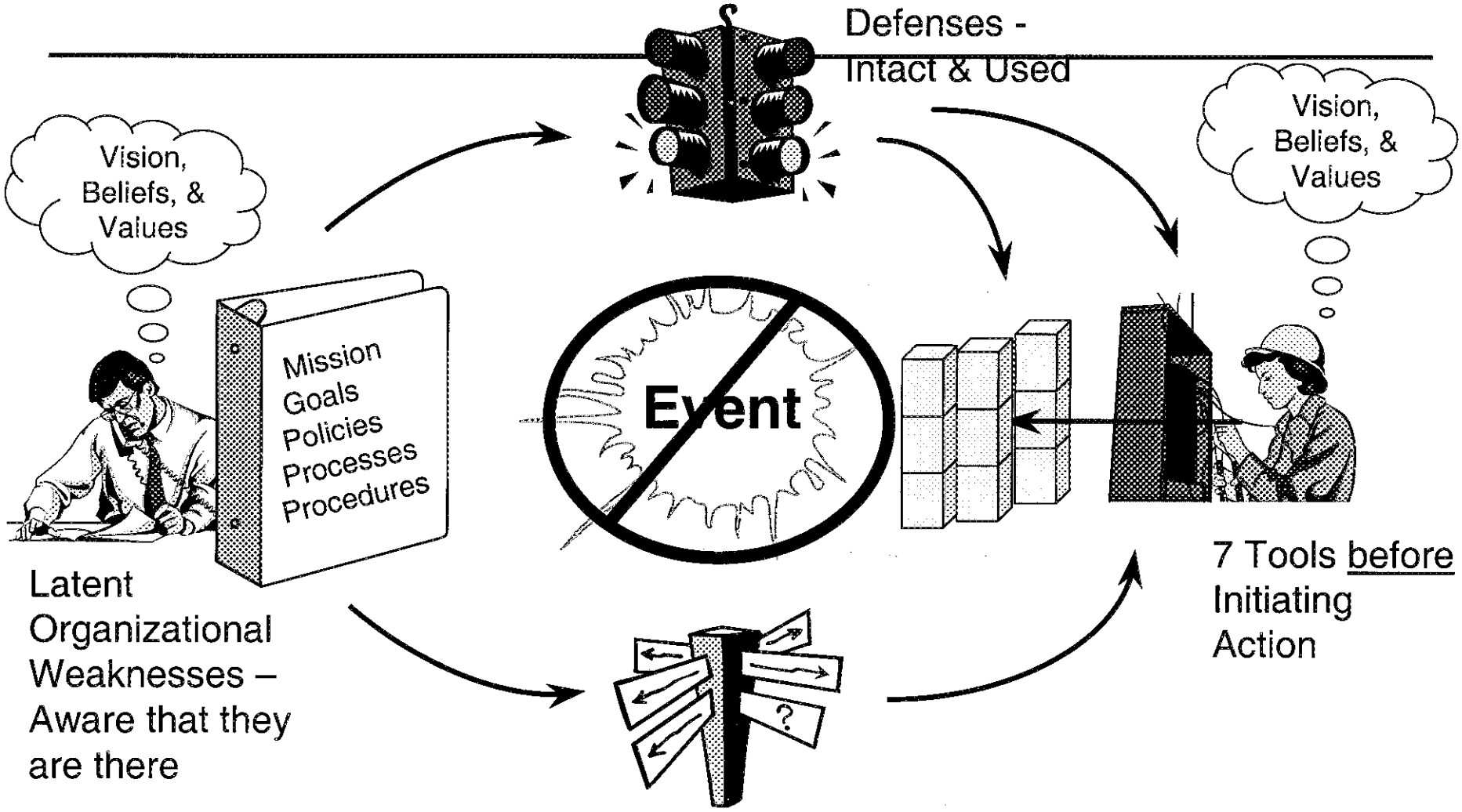
Total Commitments 23: All Completed



The comprehensive actions taken since the 2001 PLC event and the implementation of new plant I&C standards have resulted in improved safety margin for safety instrumented systems.

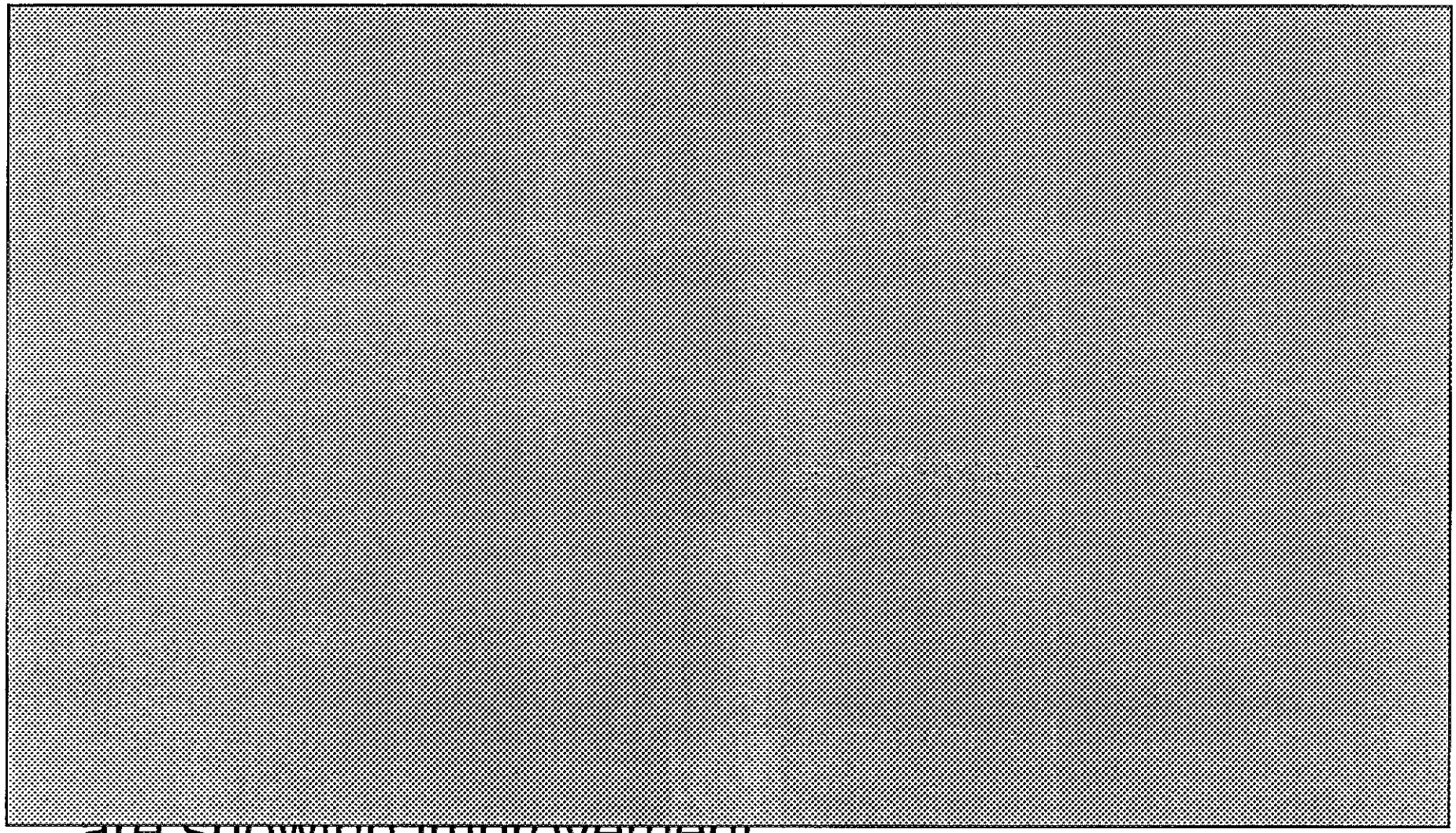
Human Performance Program Status

Human Performance: Anatomy of Success



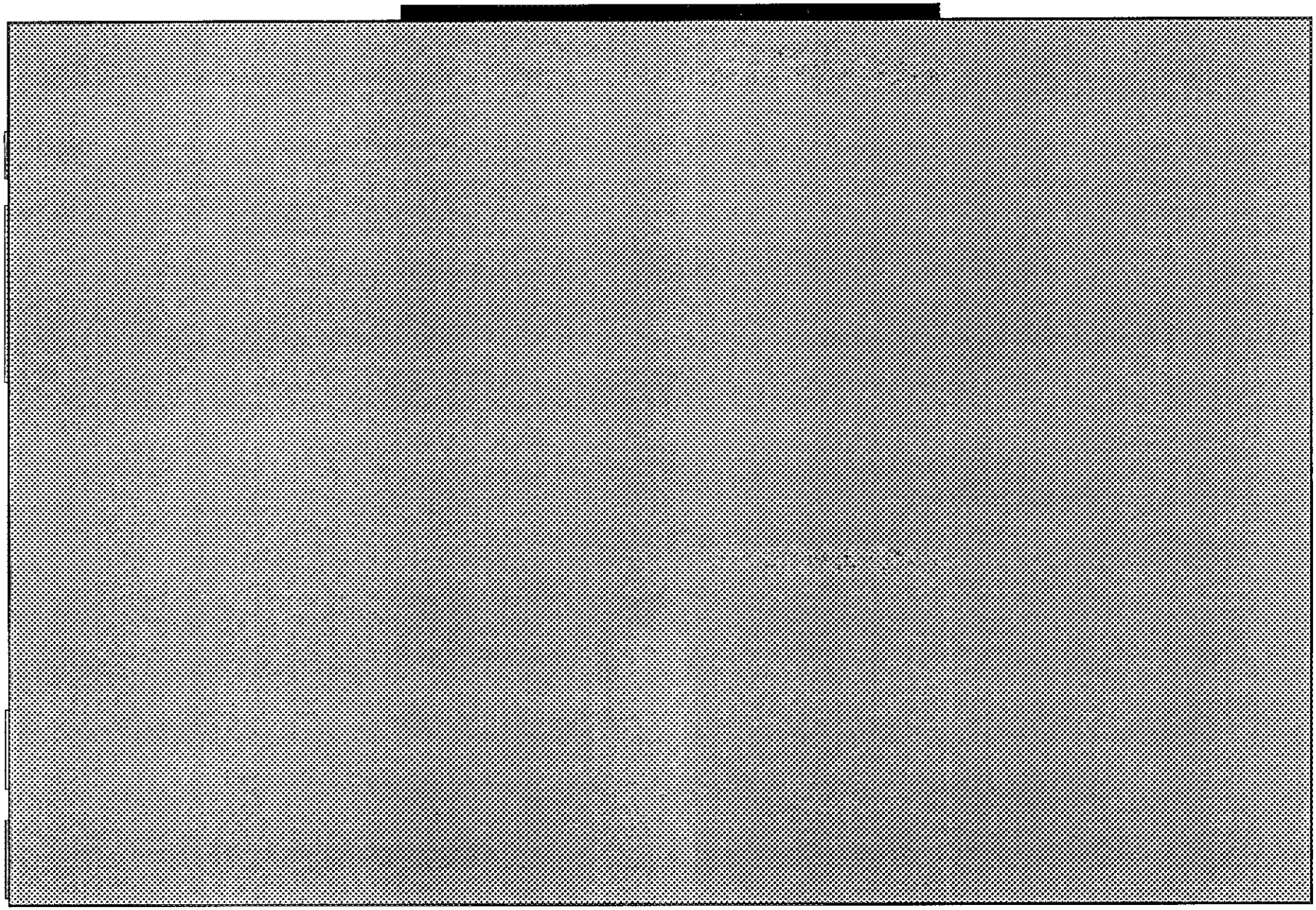
Columbia Plant

Procedure Use and Adherence Improvement



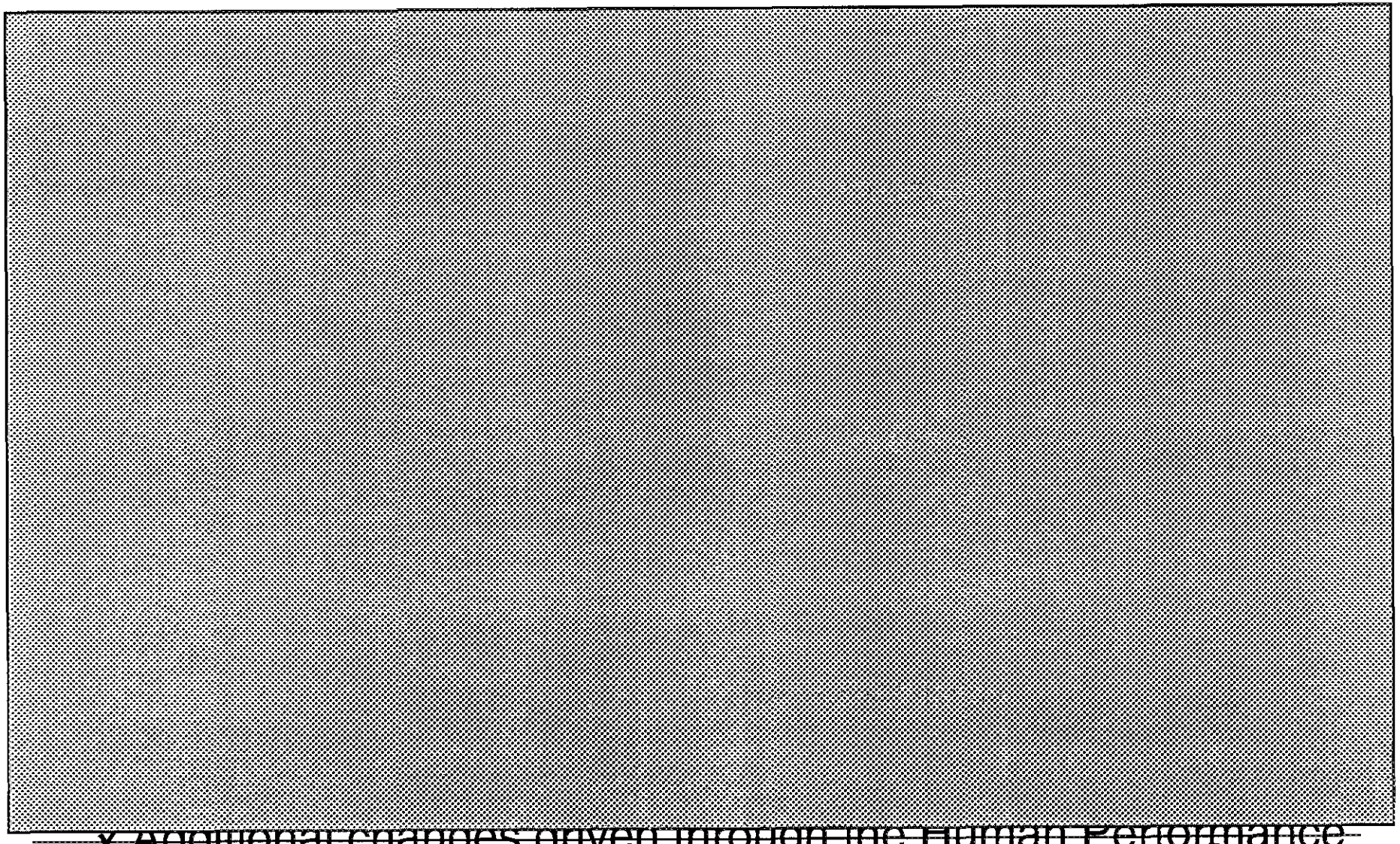
are showing improvement

Commercial information to be withheld from public information in accordance with 2.390



Columbia Plant

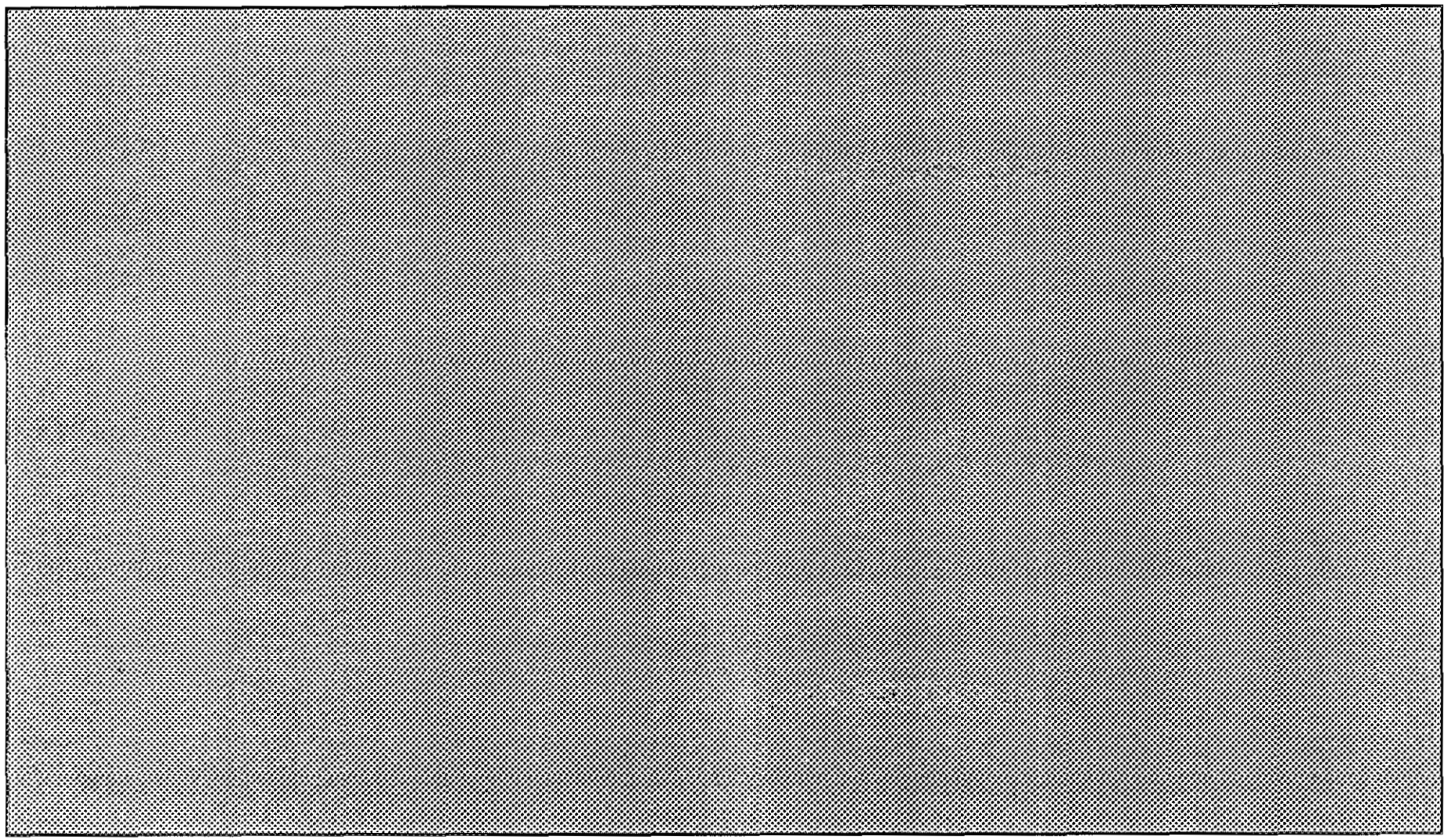
Initiatives to Correct Procedure Adherence Culture



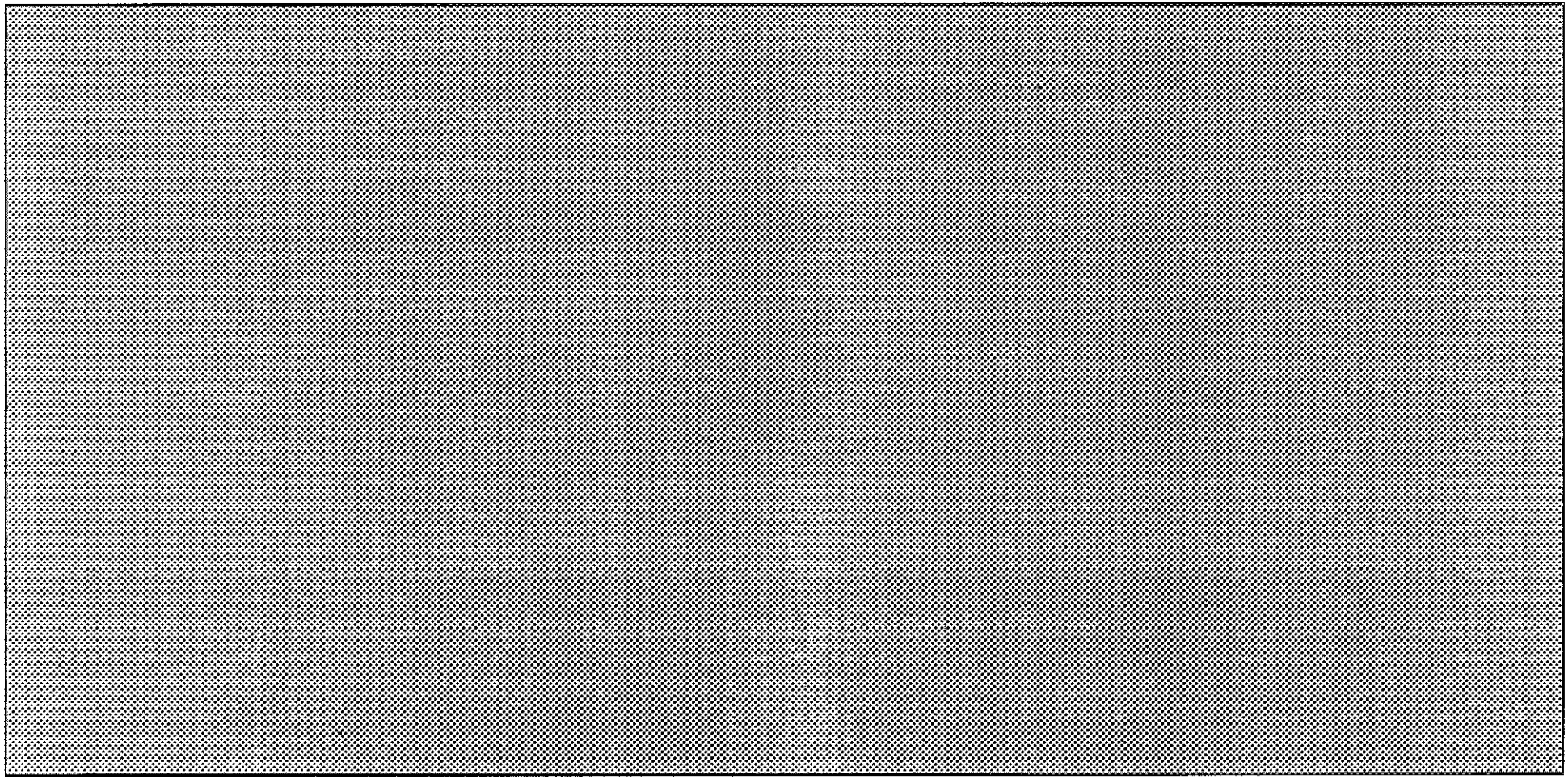
- Additional changes driven through the Human Performance (HuP) and Observation programs

Columbia Plant

Initiatives to Correct Procedure Adherence Culture

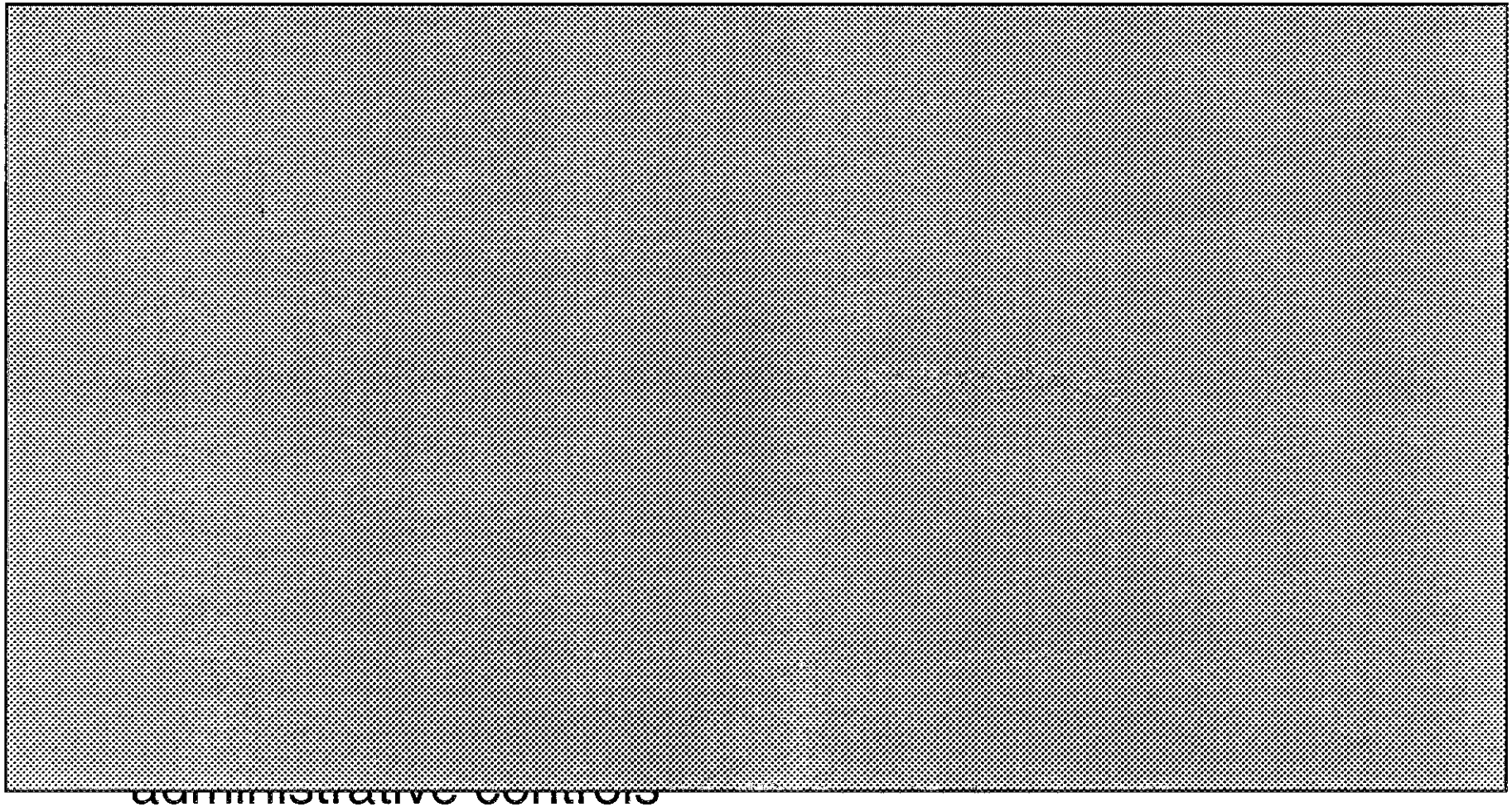


Training/Qualification Status



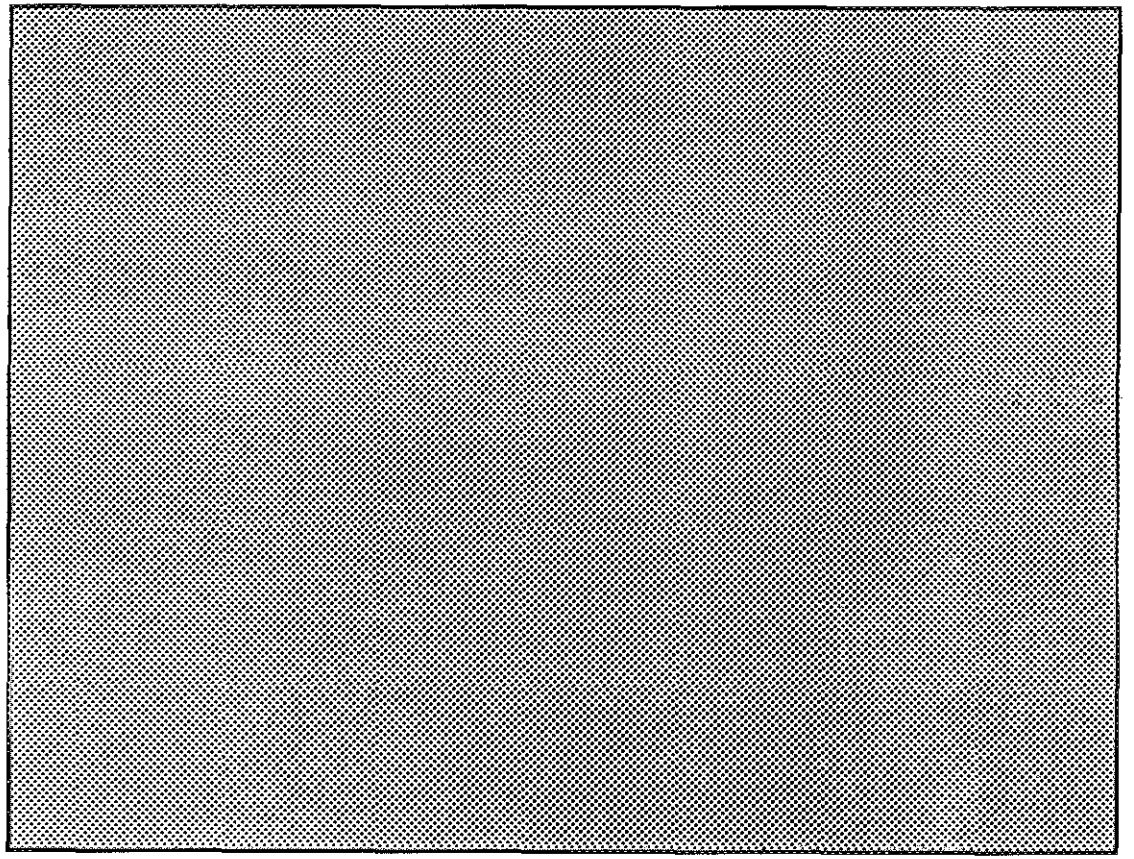
Columbia Plant

Initiatives to Correct Procedure Adherence Culture



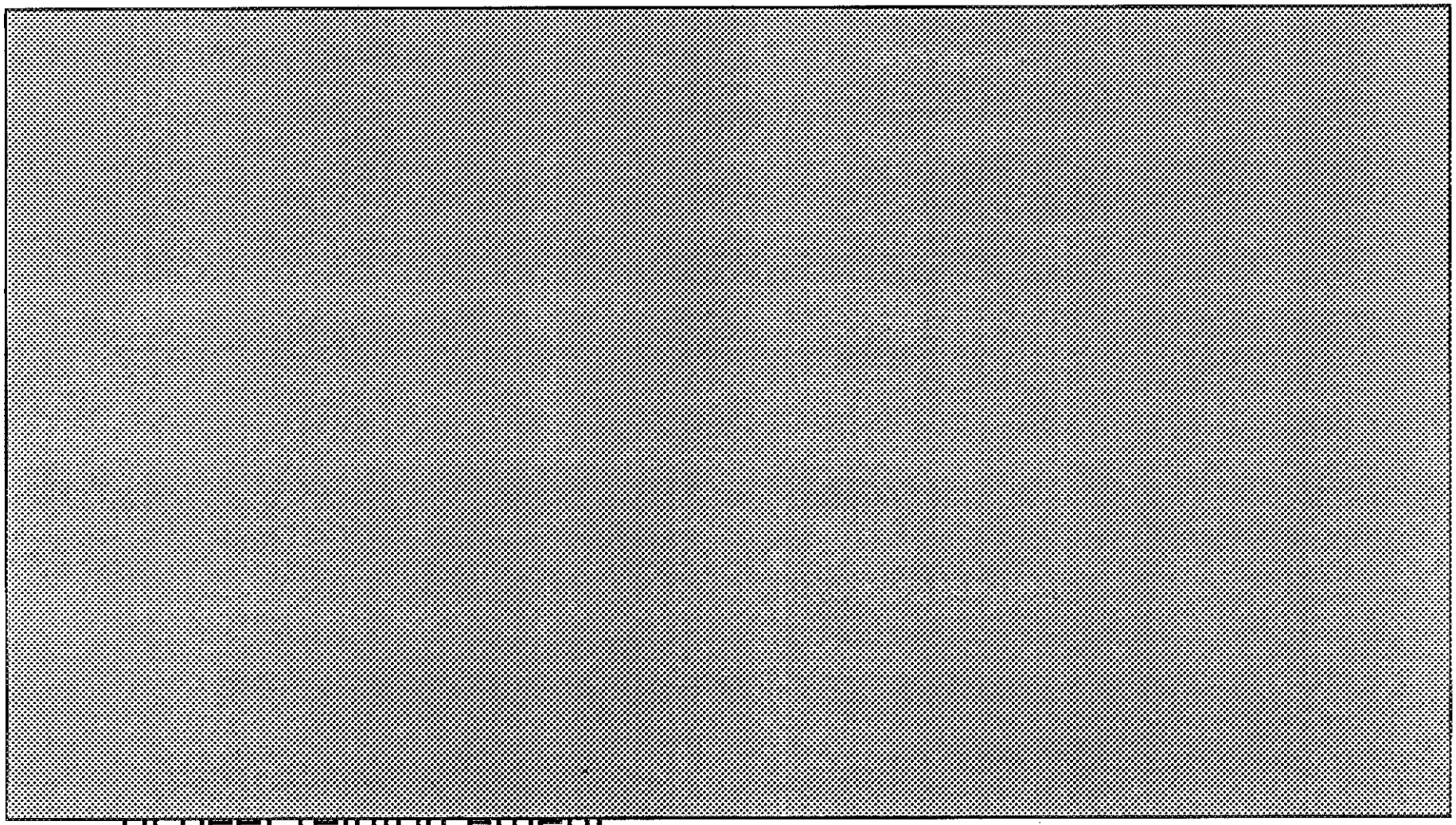
administrative controls

Application of HuP Tool Kit to Reduce the Number and Severity of Events



Columbia Plant

Initiatives to Correct Procedure Adherence Culture



of peer reinforcement.

Westinghouse Columbia Plant Management Is Aggressively Pursuing Its Plans to Achieve Procedure Adherence Excellence through Human Performance implementation.

NCS Program Status

Intregrated Safety Analysis

CSA's
CSE's
PHA's

ISA
This includes process description, hazards, accident scenarios, and preventive measures

RA108 Sketches
Identify Hazards and Controls that Prevent Accidents

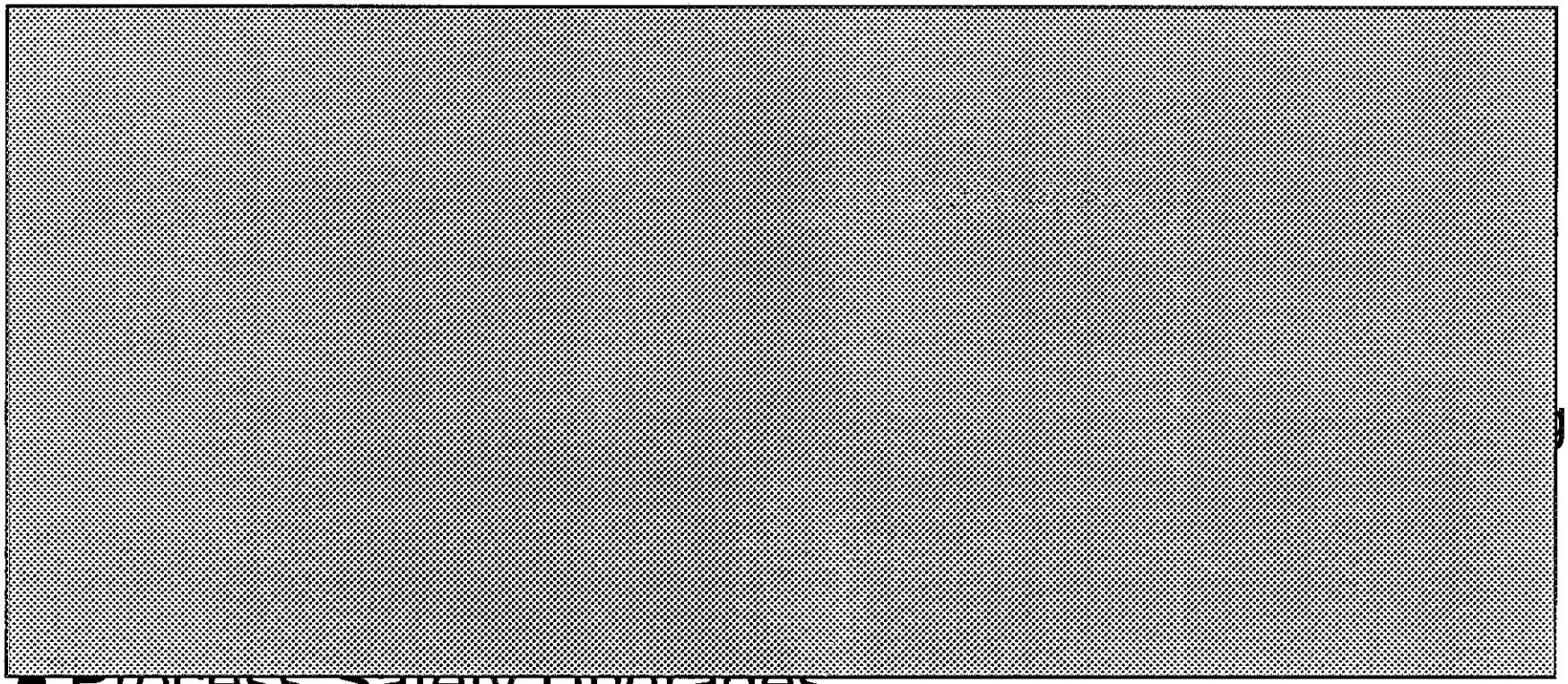
ISA Summary
This is a shortened version of the ISA that is submitted to the NRC

Procedures
Include Safety Significant Information from the Sketches

ANALYZED SPACE

Configuration Control Request
A request to change the process may take us out of analyzed space

ISA Results

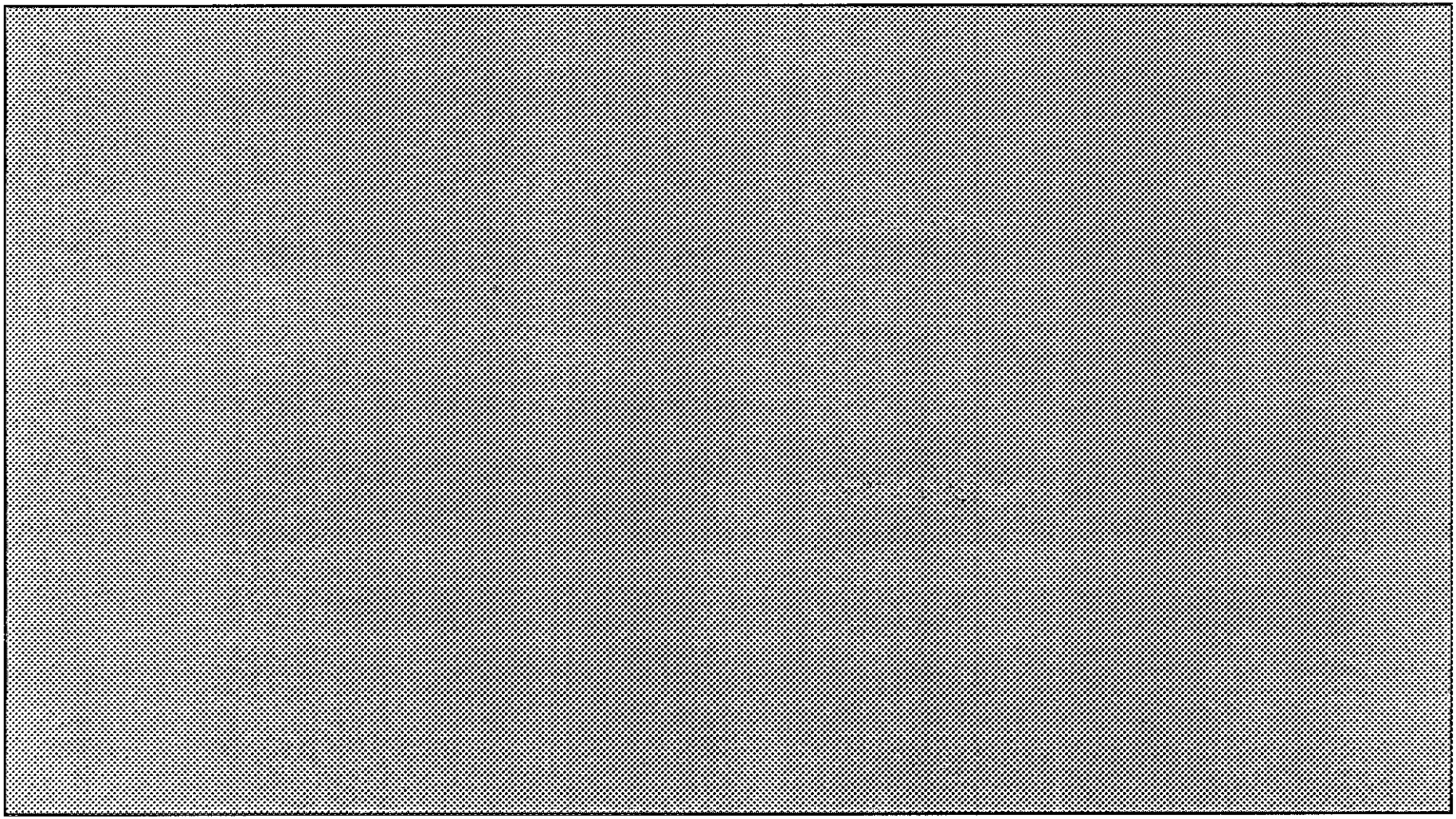


- Process Safety Upgrades

Commercial information to be withheld from public information in accordance with 2.

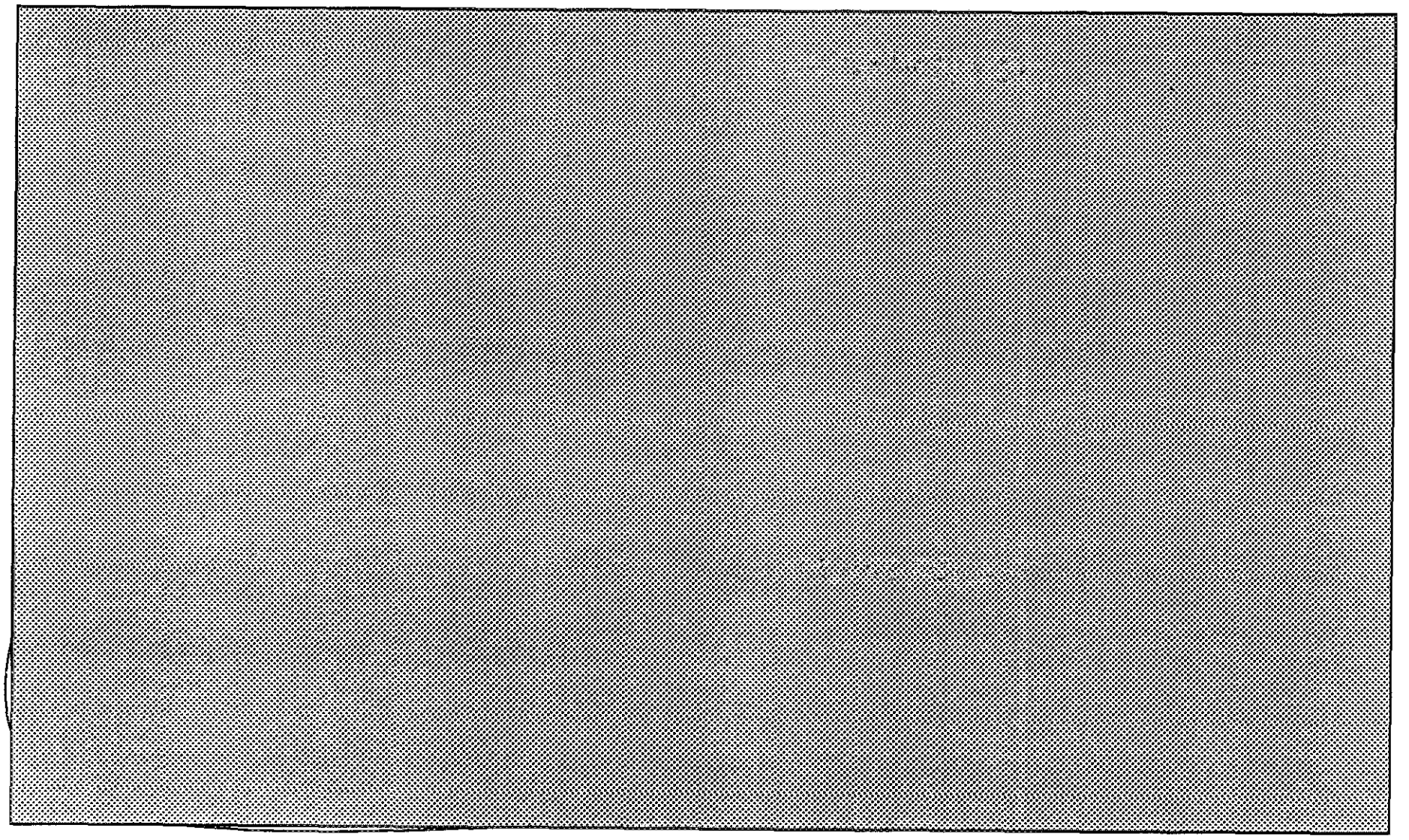
Columbia Plant

NRC Notices of Violations



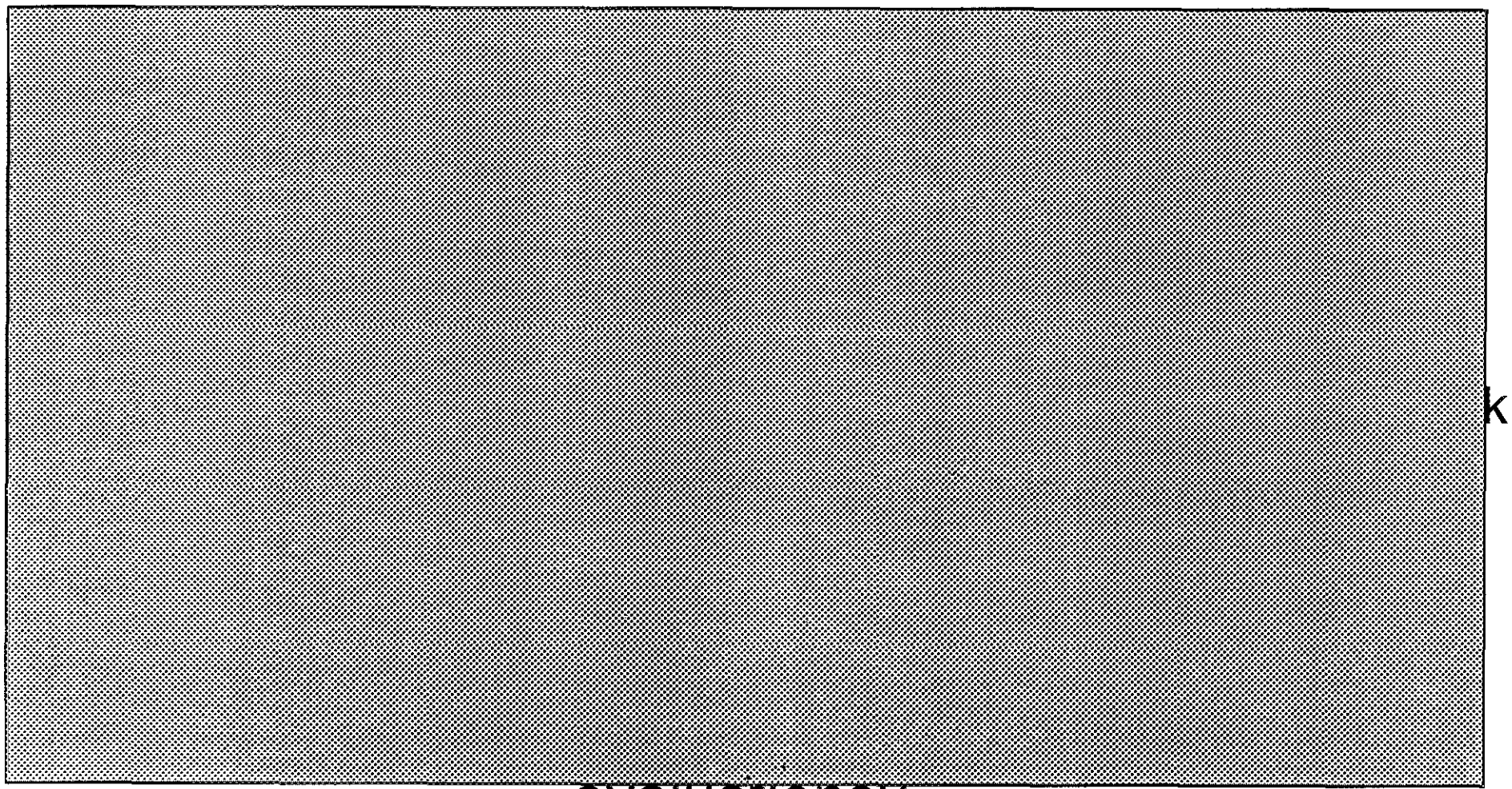
Commercial information to be withheld from public information in accordance with 2.390

Columbia Plant



Columbia Plant

'04 Events Are Revealing Something Different...



k

evaluations?

* non-favorable geometry

NCS Audit – Description of What We Did

- An independent audit of the Nuclear Criticality Safety (NCS) program was conducted over two weeks in August 2004 to determine how well the NCS program implements the requirements of the SNM-1107, as well as the guidance of the ANSI Standards for NCS programs.
- The audit team included Westinghouse and external personnel with expertise in criticality safety, chemical process engineering, risk analysis, EH&S and Quality Assurance and was led by the Westinghouse Corporate EH&S Manager.

NCS Audit Scope

- Review of Westinghouse Columbia Fuel Fabrication Facility administrative and management procedures to confirm that license SNM-1107 requirements are effectively implemented into management and operating procedures.
- Review of any NRC violations, reported events, unusual occurrences, process upsets, and inspector follow up items in the last two years and confirm that appropriate follow-up actions have been taken.
- Review of any significant items identified by Westinghouse Columbia Fuel Fabrication Facility.
- Review effectiveness of implementation and compliance with criticality safety controls on the production floor.
- Review the effectiveness of management compliance with programmatic criticality safety requirements. Review of internal Monte Carlo code validation efforts.

NCS Audit Scope (cont.)

- Review criticality safety staffing levels and the effectiveness of the criticality safety engineer training and qualification program.
- Review the effectiveness of the internal design change control and configuration management program.
- Review the effectiveness of operational compliance relative to SNM-1107 program commitments.
- Review the effectiveness of documented criticality safety evaluations (CSEs) and analyses (CSAs) as they pertain to computational (neutronic) analysis and derivation of process subcritical limits.
- Review the effectiveness of criticality safety function involvement in our integrated safety analysis (ISA) program relative to 10CFR70 and NRC-approved ISA Plan.
- Review the effectiveness of the integration of the criticality safety controls into the ISA program.

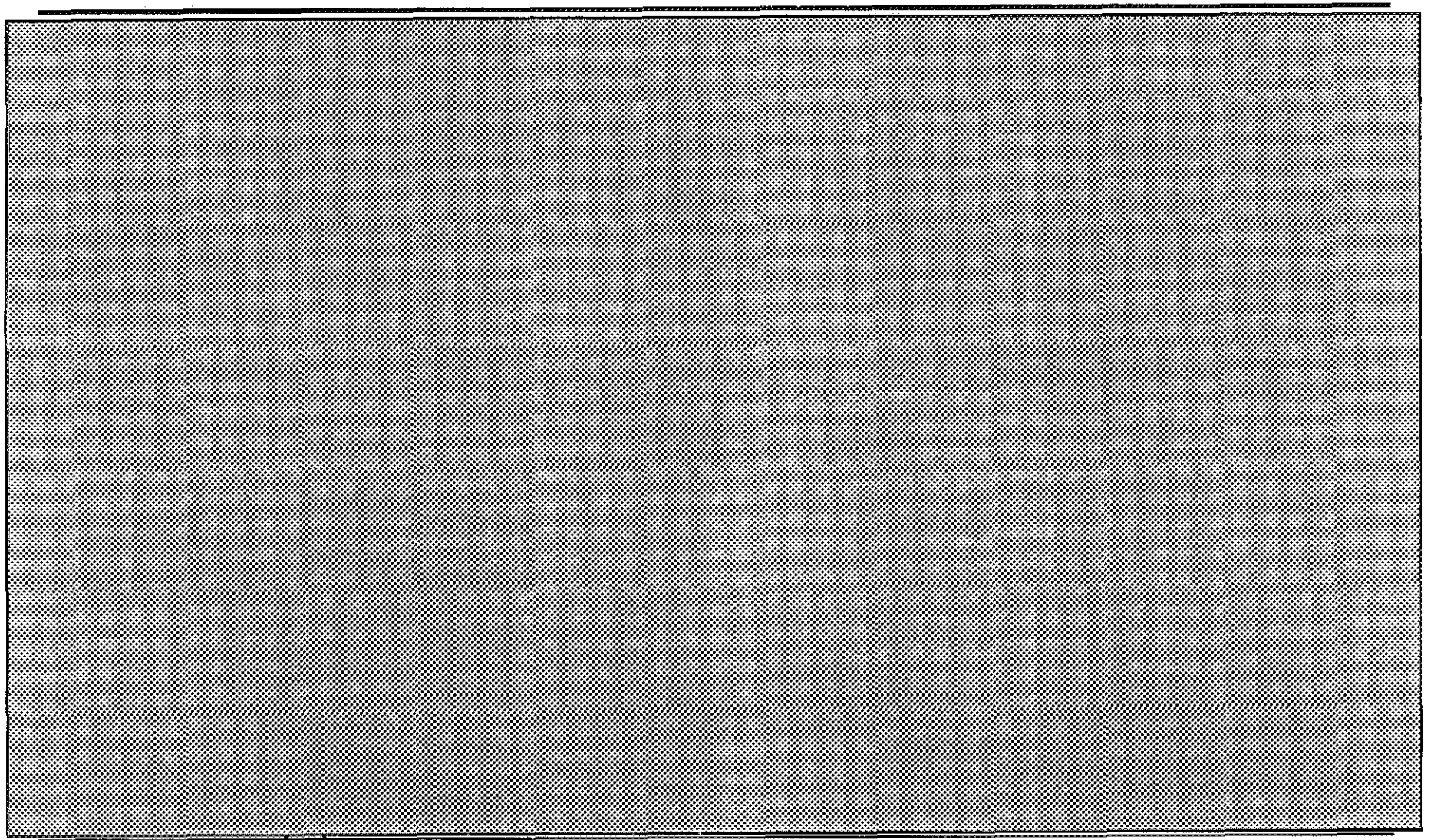
Columbia Plant

Criticality Safety Audit Team Findings

- Results
  - *No indication that the plant should cease any of its operations*
  - Good system for verification of safety significant controls (SSC's)
  - However, action is needed to address organizational, programmatic and several miscellaneous weaknesses concerning NCS at CFFF

Columbia Plant

Criticality Safety Audit Team Findings

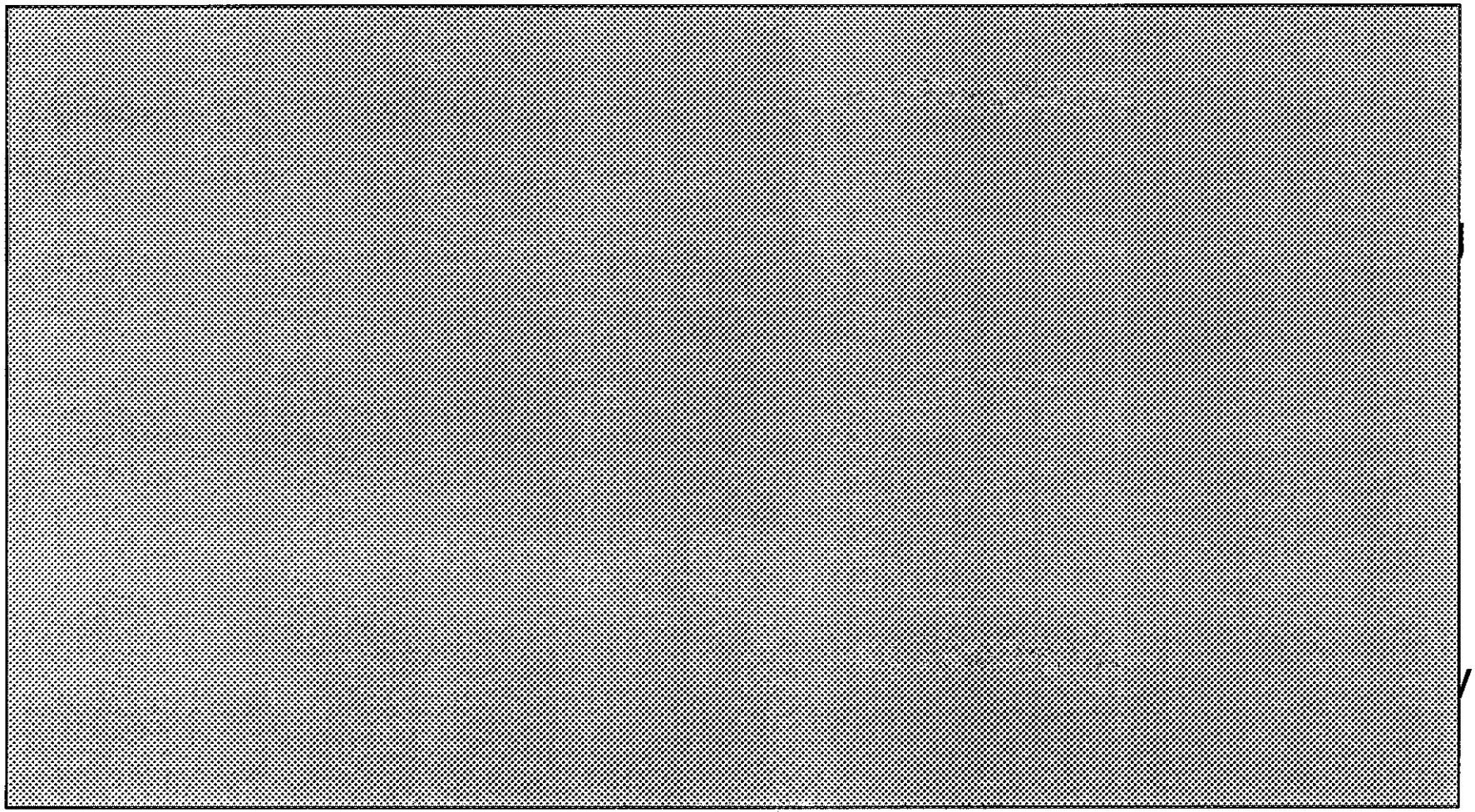


requests)

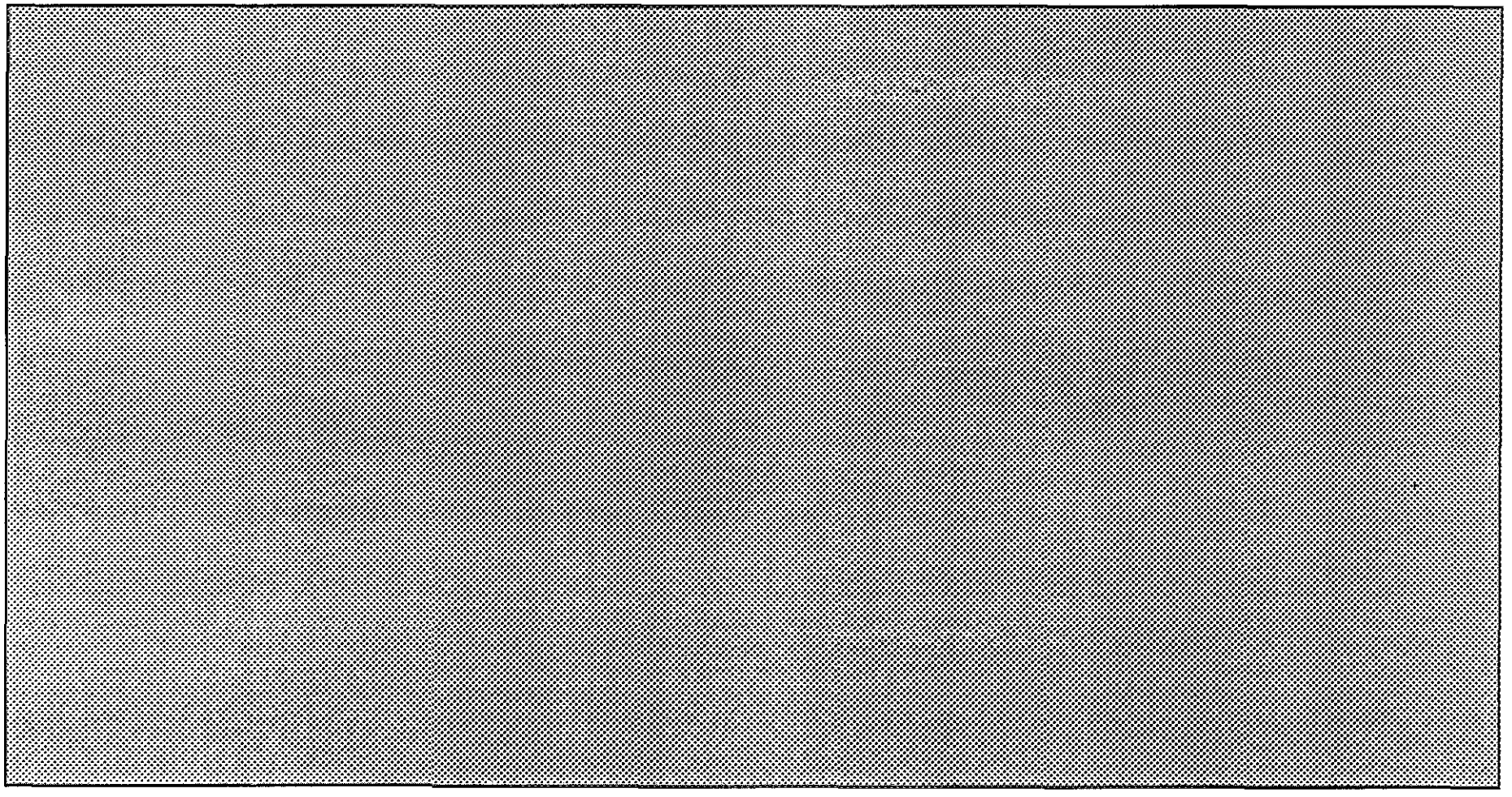
Inappropriate reliance on purely administrative controls

Columbia Plant

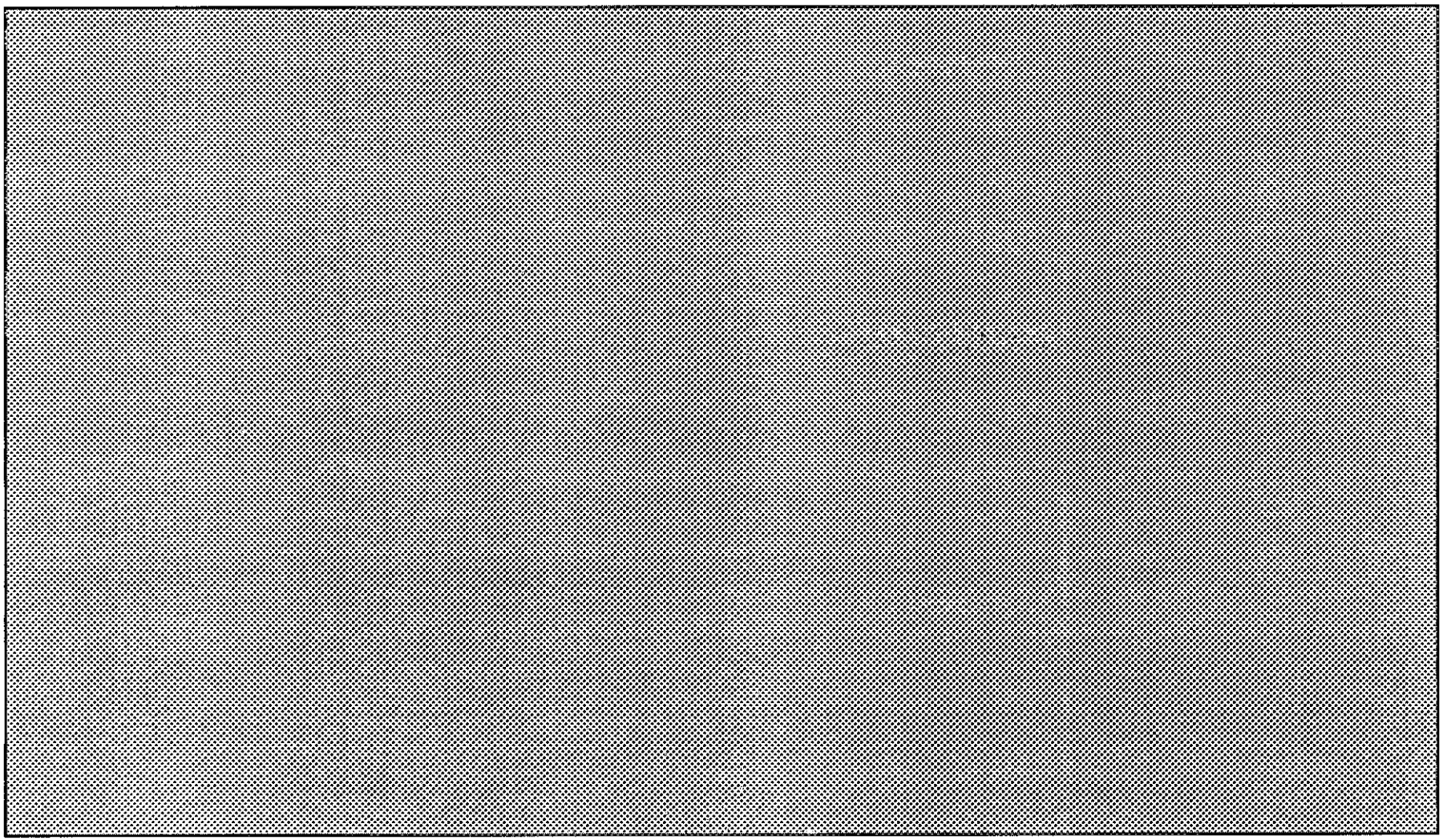
Criticality Safety Audit Team Findings



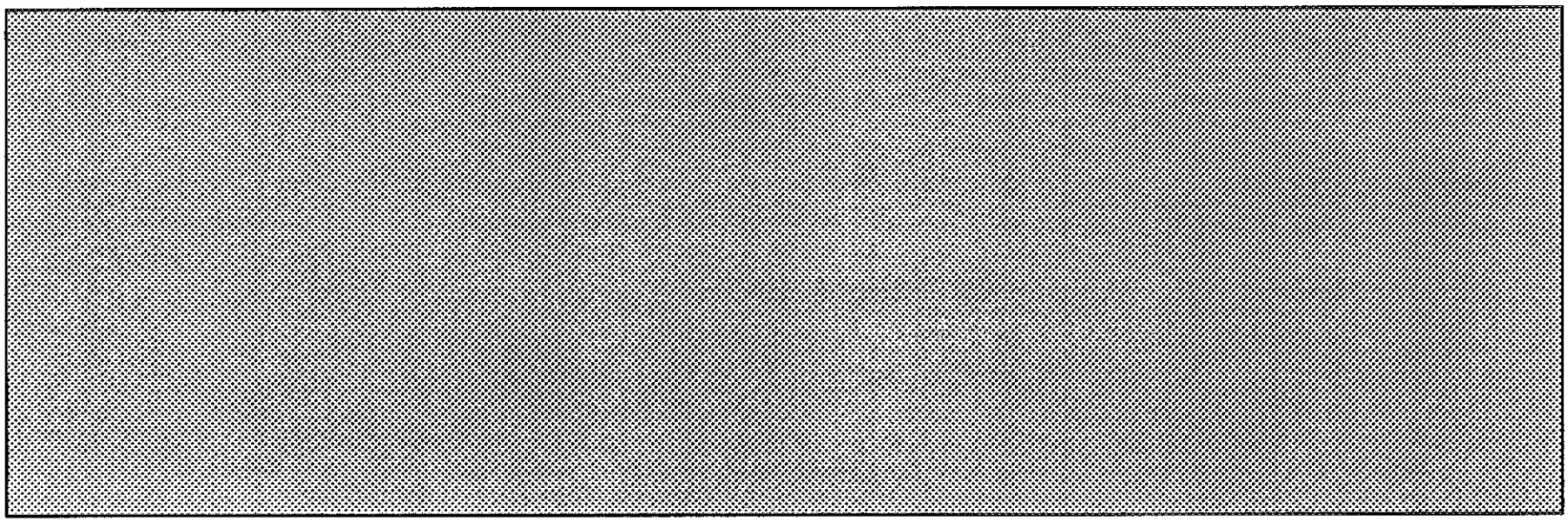
Steps to Strengthen NCS Organization & Performance - Completed



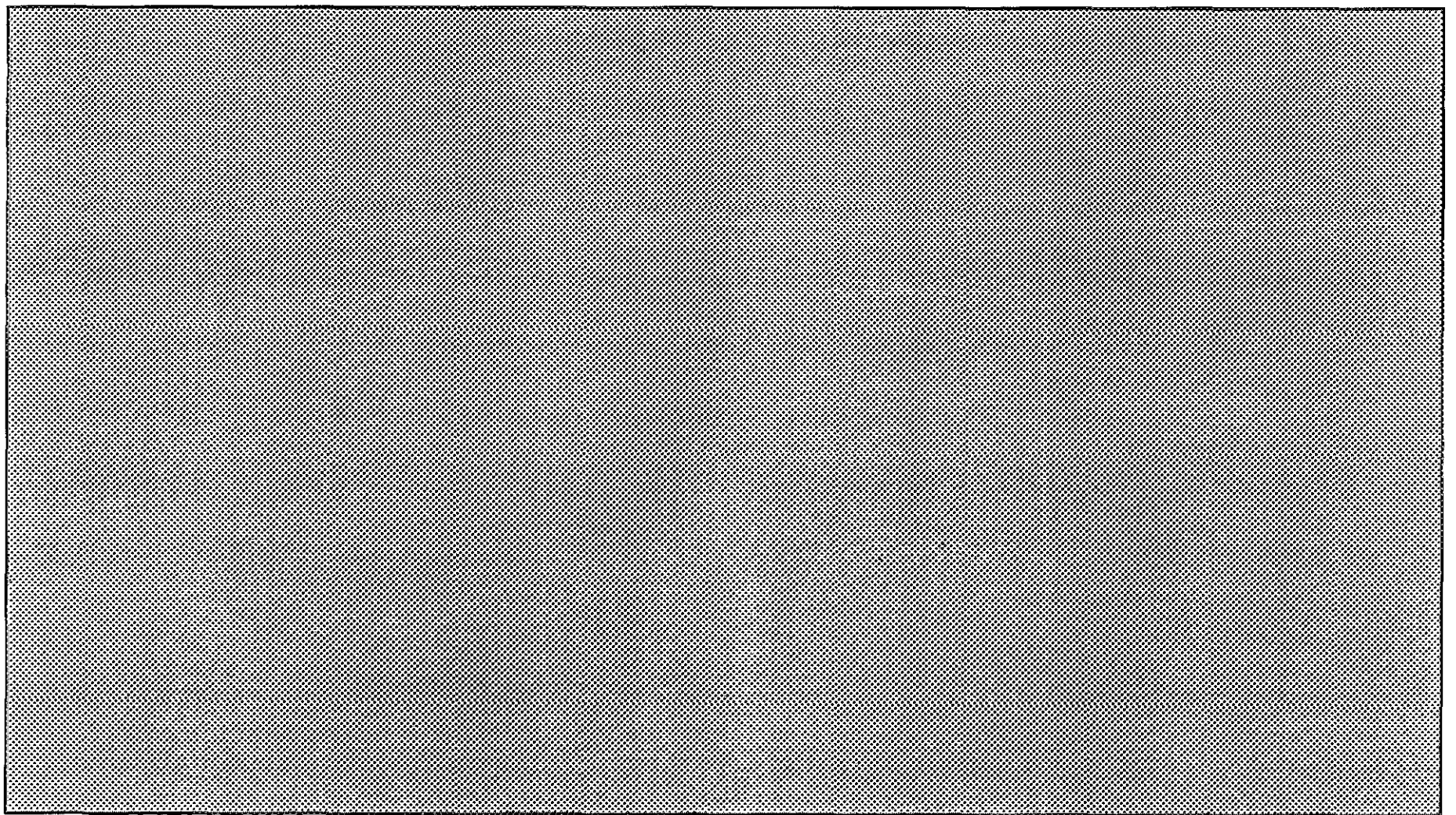
Steps to Strengthen NCS Organization & Performance – In Process



Steps to Strengthen NCS Organization & Performance – In Process



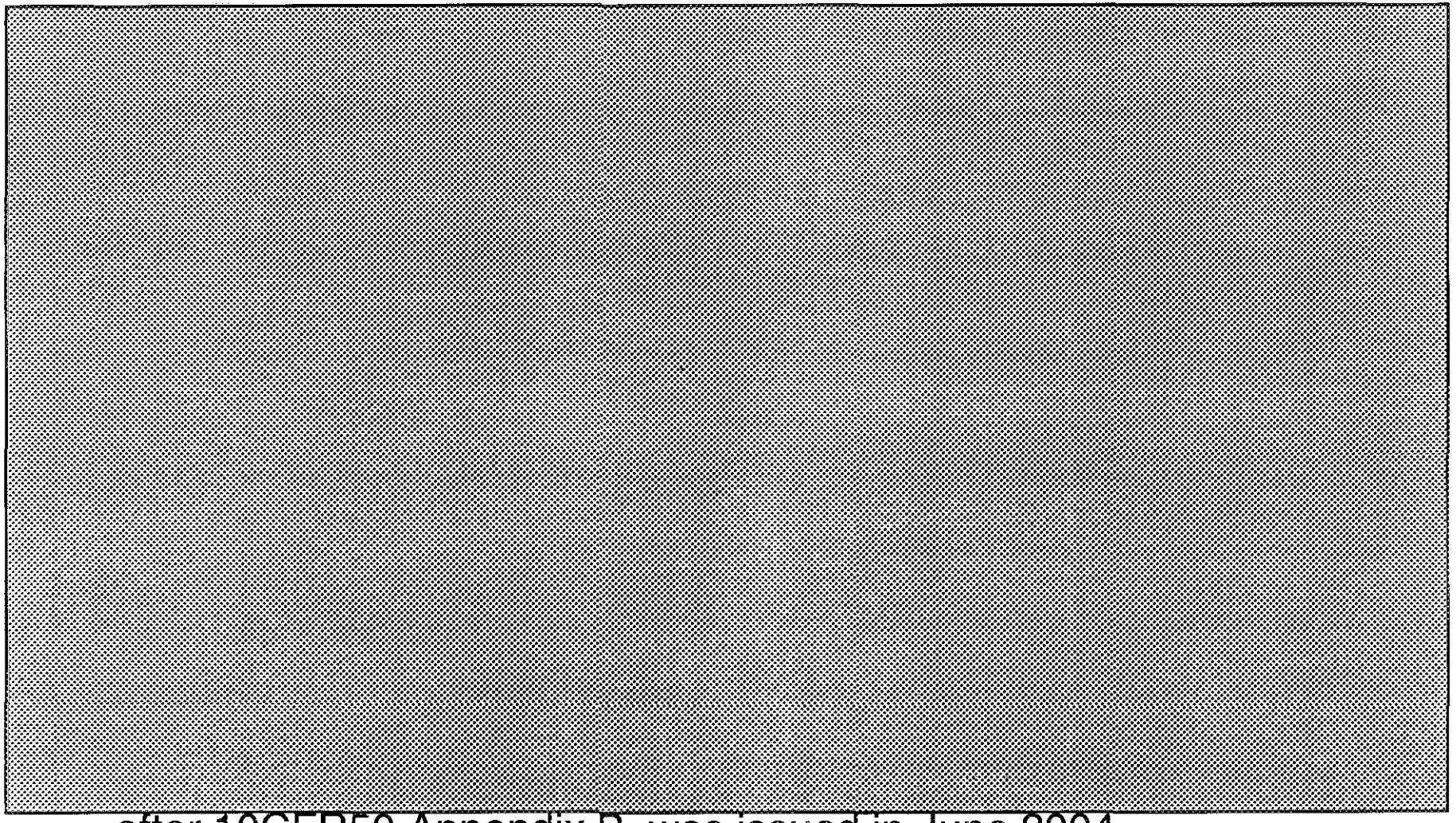
Nuclear Criticality Safety Summary



mutually agreed schedule

Improvements to Management Systems

CFFF Management Systems



after 10CFR50 Appendix B, was issued in June 2004.

CFFF Management Systems (cont.)

- –Substantial progress has been made in upgrading the EH&S quality/safety records program.
- –The EH&S audit and compliance inspection programs have been upgraded, utilizing both internal and external expertise, to ensure independent assessment from an outside perspective.
- –Significant effort is underway to enhance the EH&S quality and training programs for EH&S personnel and others (e.g., process engineers and manufacturing personnel)
- –The shop floor utilizes an effective early warning system for safety and compliance issues (Redbook System)
- –The plant has an effective formal event investigation and corrective action process (CAPs).

CFFF Management Systems (cont.)

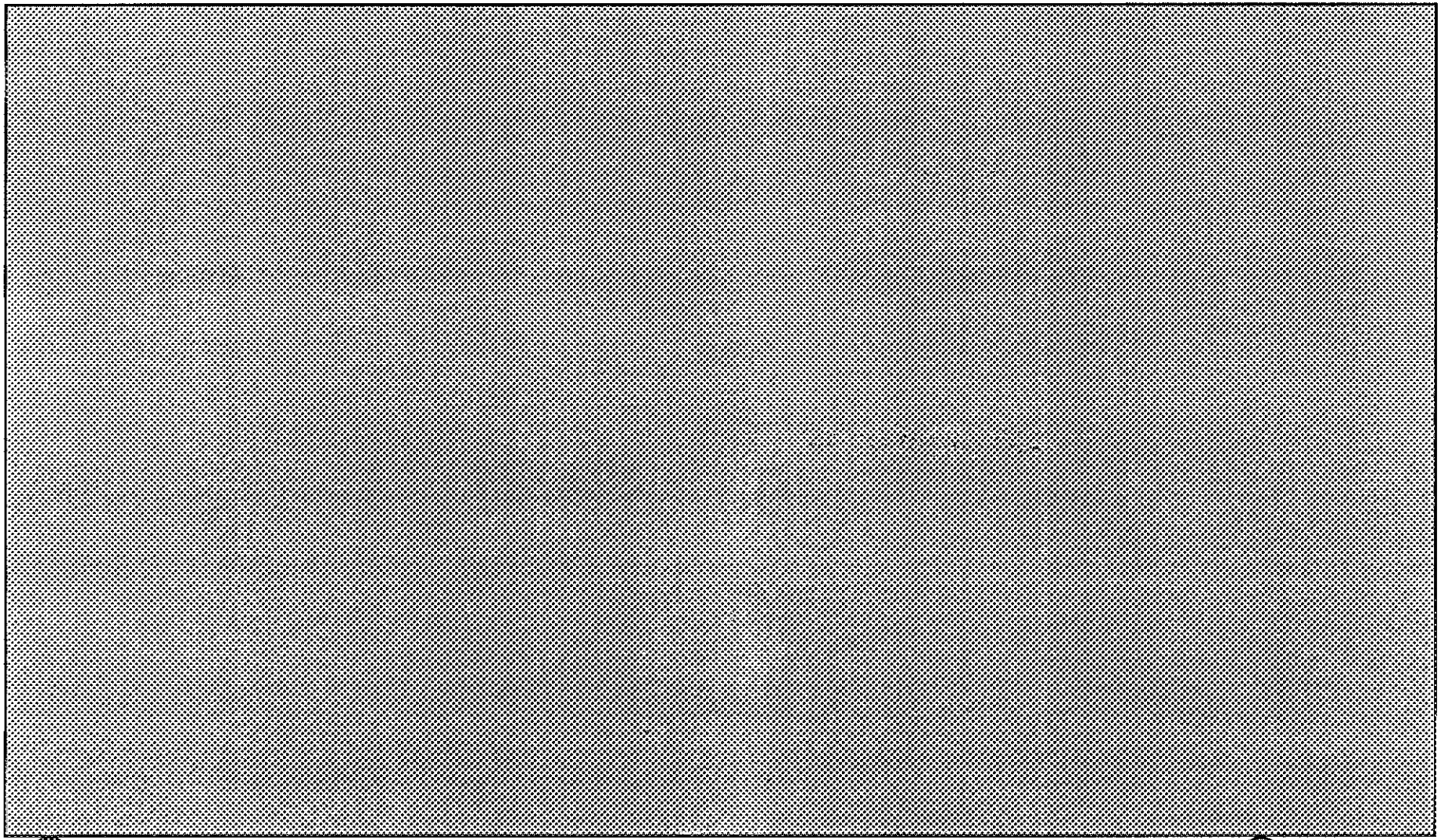
- Robust systems are in place to manage configuration changes to:
  - –the CFFF Site and Structures
  - –Process and Equipment Design, including process safety information
  - –Maintenance procedures and activities
  - –Shop floor and office activities (e.g., Operating Procedures, Supplementary Operating Instructions, Process Information Forms)
  - –Drawings
  - –System Software and Computer Programs
  - –Development projects
  - –Organizational structures and personnel changes

CFFF Management Systems (cont.)

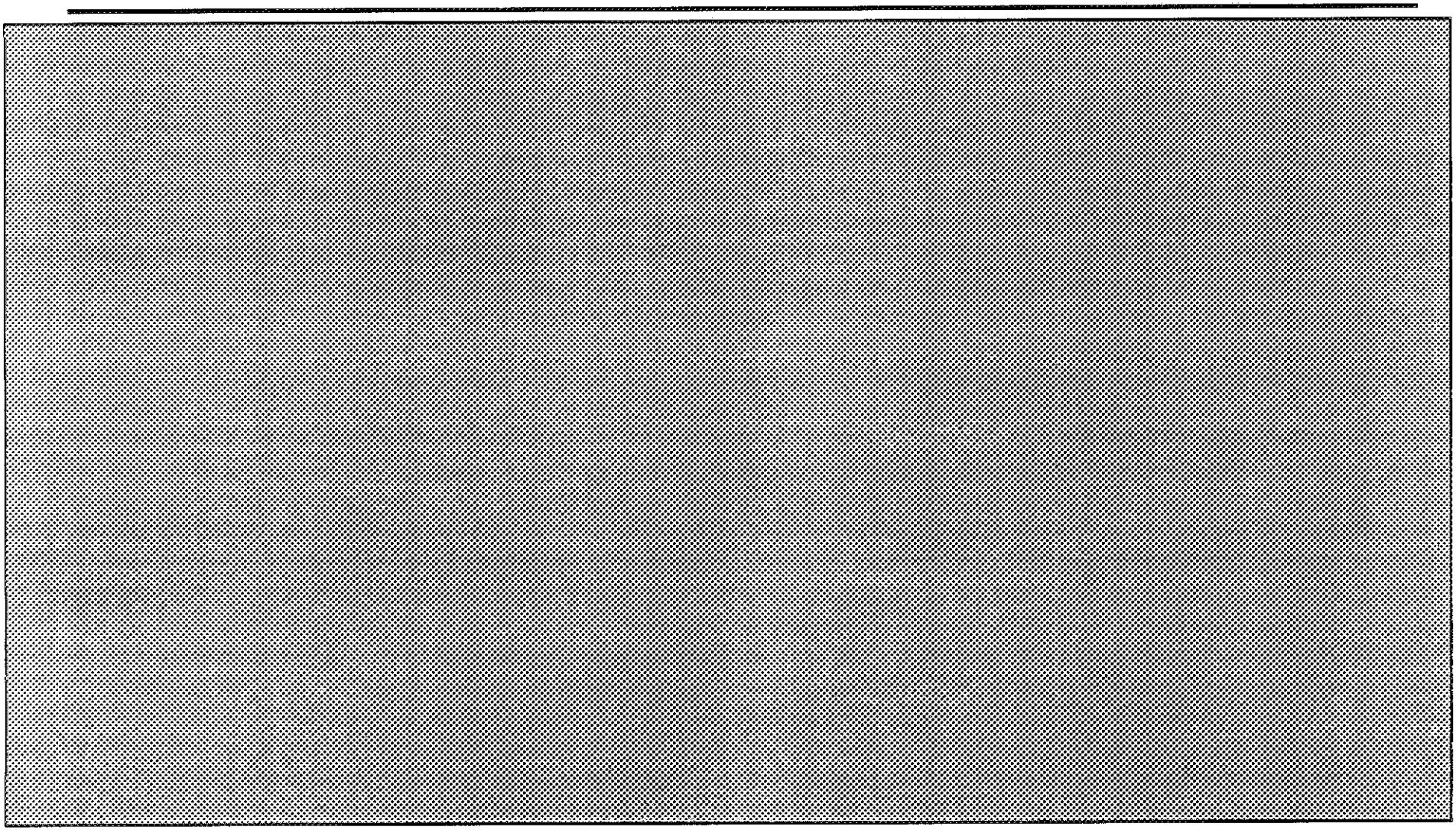
- Internal and external audit data, as well as event-related information, is analyzed to identify and prioritize improvement opportunities. Corrective actions are tracked to completion via the Redbook and CAPs systems.
  - –Both internal and external audits are entered in CAPs
  - –Event investigations and corrective actions are tracked via CAPs

- Safety/Compliance information (e.g. violations, 91-01 notifications, EH&S shop floor audits) are subject to trend analyses, are reported through trips of the local area event clocks, and are discussed in are huddle meetings at the beginning of each shift.

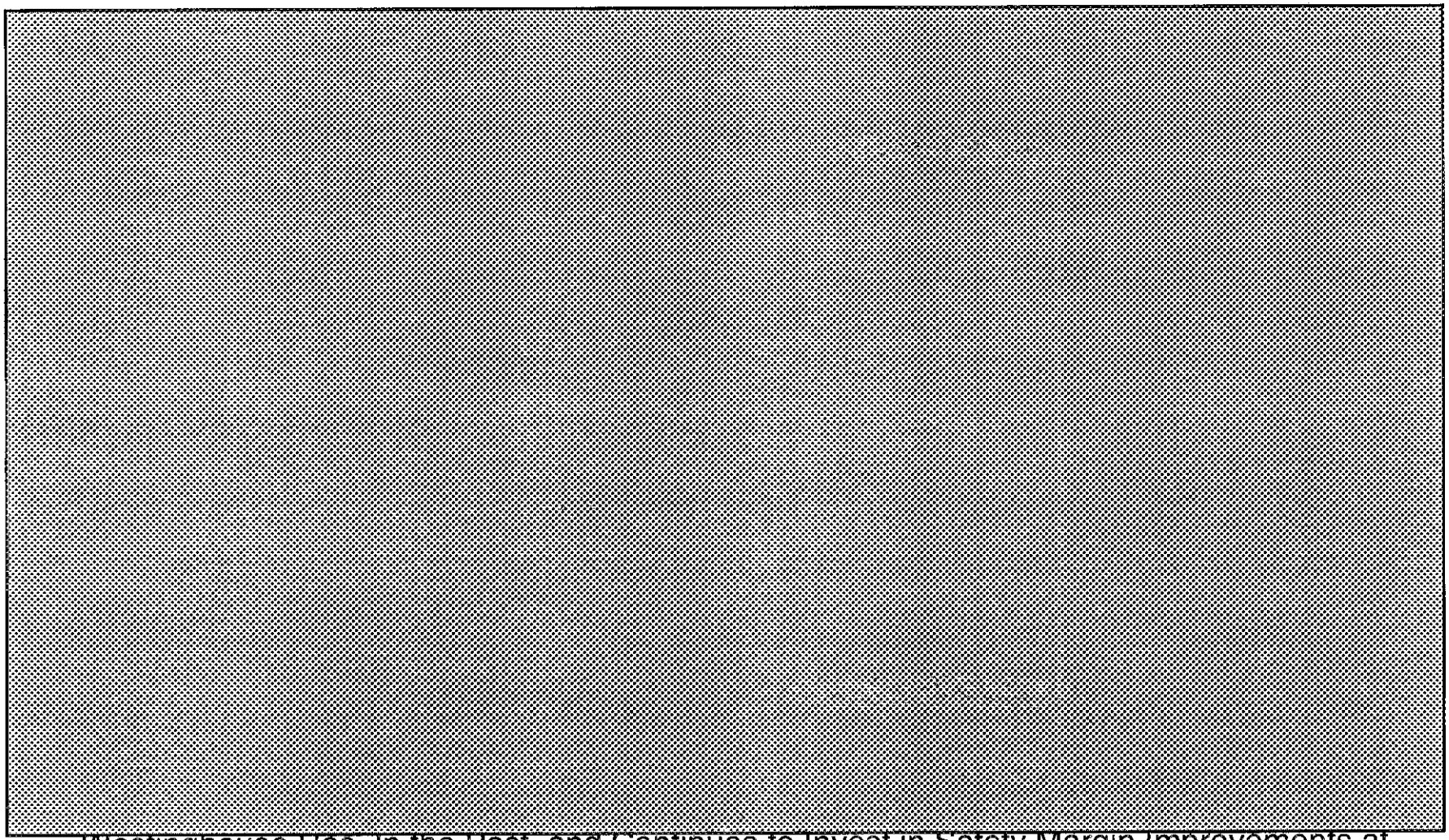
EH&S Inspection Results



EH&S Inspection Results



Management Systems Summary: The Columbia Plant Has a Strong Safety Basis



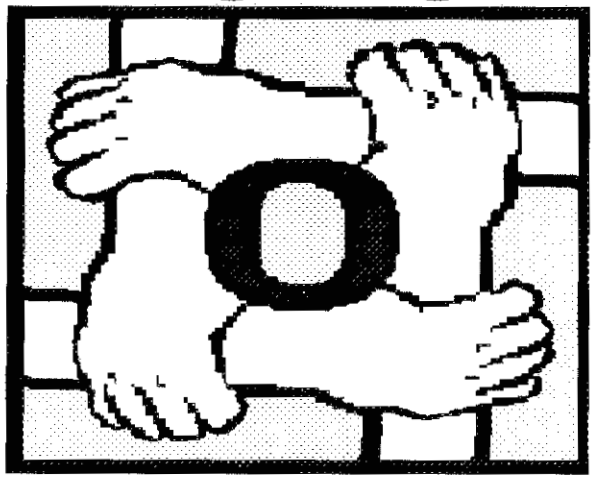
- Westinghouse Has, In the Past, and Continues to Invest in Safety Margin Improvements at the Columbia Plant
- The Columbia Plant has rolled out a comprehensive Human Performance Program

The Westinghouse Management Perspective

- We believe Westinghouse is making good progress in improving its regulatory performance; however, several important areas for improvement remain
  - –Total procedure compliance via implementation of a comprehensive Human Performance Program
  - –Ownership of the plant's design basis safety case by the Operations and Process Engineering functions
  - –Organizational and programmatic upgrades of the NCS function, including a comprehensive review of CSA's/CSE's
- Westinghouse Management is fully committed to resolving all issues associated with the areas for improvement cited

Westinghouse Is Fully Committed To Achieving World Class Safety And Regulatory Compliance In All Columbia Plant Operations.

Working Together



The Target is Zero

A BNFL Group
company