



Commonwealth Edison

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DOD/RIDS

October 23, 1989

Mr. A. Bert Davis
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Davis:

I would like to let you know what Commonwealth Edison is doing in response to the recent nuclear industry emphasis on the need to improve reactivity management practices. We have made a comprehensive review of our current Reactivity Management Program from the standpoint of the recent operating experience provided by INPO. As a result, several areas were found where our program could be enhanced. Principally, we want to instill a heightened sensitivity to reactivity management and promote a conservative operating philosophy throughout our nuclear area.

We have worked especially hard in developing methods to effectively communicate our enhanced program to all nuclear personnel. I am enclosing a videotape presentation on the importance of reactivity management that has been especially effective in communicating our story. Additionally, I am also enclosing a pamphlet that has been developed which presents our philosophy on conservative operations, and clearly identifies the role of nuclear personnel in the Reactivity Management Program.

I, and my senior staff, visited each nuclear station this summer to present an introduction to the videotape, to describe the purpose of the pamphlet, to discuss the actions that are being taken to improve our program, and then to encourage discussions and suggestions from personnel. The meetings were attended by control room operators, shift management, nuclear engineering staff, other technical staff, and station management. Also, the meetings were videotaped in order that they could be shown to people who were not available to attend the meetings. Our initial response to these meetings has been excellent, with personnel eager to suggest ways in which reactivity management could be improved.

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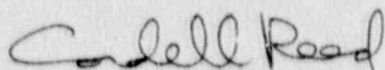
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Additionally, Attachment A describes the specific actions we are taking to enhance our Reactivity Management Program. This new initiative is being well received by our personnel, and we plan to give it top priority in the future.

Sincerely,

A handwritten signature in cursive script that reads "Cordell Reed".

Cordell Reed
Senior Vice President

Enclosures

cc: B. L. Thomas (w/encls.)

Attachment A

Actions Being Taken as Part of CECO's
Reactivity Management Action Plan

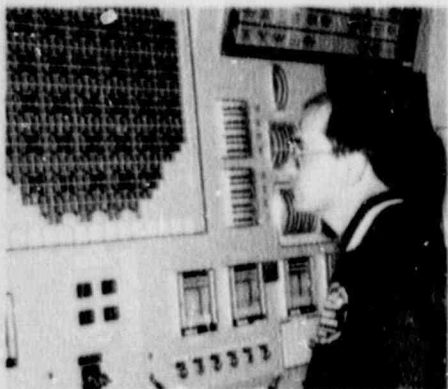
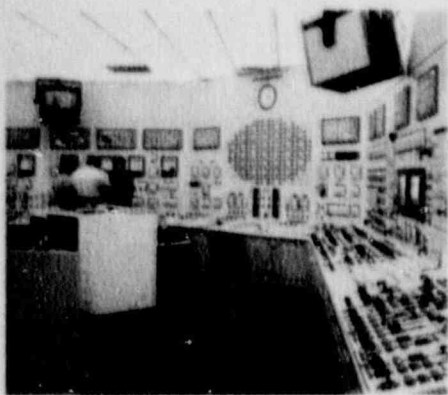
1. Chief Nuclear Engineer position established where major duties are: (completed)
 - a. Act as Company's primary safety officer regarding reactivity control and prevention of nuclear fuel damage during reactor operation or fuel handling.
 - b. Review and approve technical accuracy of Company's core management and analysis procedures.
 - c. Review and concur with analysis methods used by fuel vendors, with technical qualifications of CECO nuclear engineers and fuel vendor analysis staff.
2. Revise management directives to emphasize responsibilities related to reactivity control and the need for conservatism. (11-01-90)
 - a. Conduct of Operations Directive
 - b. Station Procedures
 - c. Train affected personnel
3. Increase on-site reactor engineering support. (01-01-91)
 - a. Establish position of Station Reactor Engineer where major duties are:
 1. Review of all station procedures involving reactivity controls.
 2. Ensure technical adequacy of the training and engineering guidance provided to plant personnel in the areas of reactivity control, reactor physics, core measurements, core heat transfer, and core physics testing; and
 3. Ensure reactor cores are operating as designed.
 - b. Increase Nuclear Engineering Group experience level and increase size from six to eight nuclear engineers.
 - c. Increase Nuclear Engineering Group Training and Qualification Program to add emphasis on operations, instrumentation, and fuel handling.
 - d. Require Nuclear Engineering Group review of procedures, training, and modifications related to reactivity control.

4. Provide improved on-site reactivity predictive and tracking capability. (01-01-91)
 - a. Upgrade on-site core predictive computer codes.
 - b. Upgrade reactor operator reactivity tracking capability.
5. Provide improved reactivity management support and oversight from corporate support groups. (11-01-90)
 - a. Nuclear Fuel Services will be made responsible for:
 1. Upgrading the newly formed PWR Nuclear Engineer Qualification Program as well as the existing BWR Nuclear Engineer Qualification Program.
 2. Reviewing the reactivity related training materials used by the Production Training Department.
 - b. The Operating Experience Department will be required to highlight reactivity issues for special attention and follow-up.
 - c. The simulator training programs will be evaluated to assure:
 1. Accurate display of reactivity events.
 2. That conservative operator actions are stressed in training on reactivity events.
 - d. Reactivity management will become a permanent topic in the Nuclear Station Performance Assessment Program.



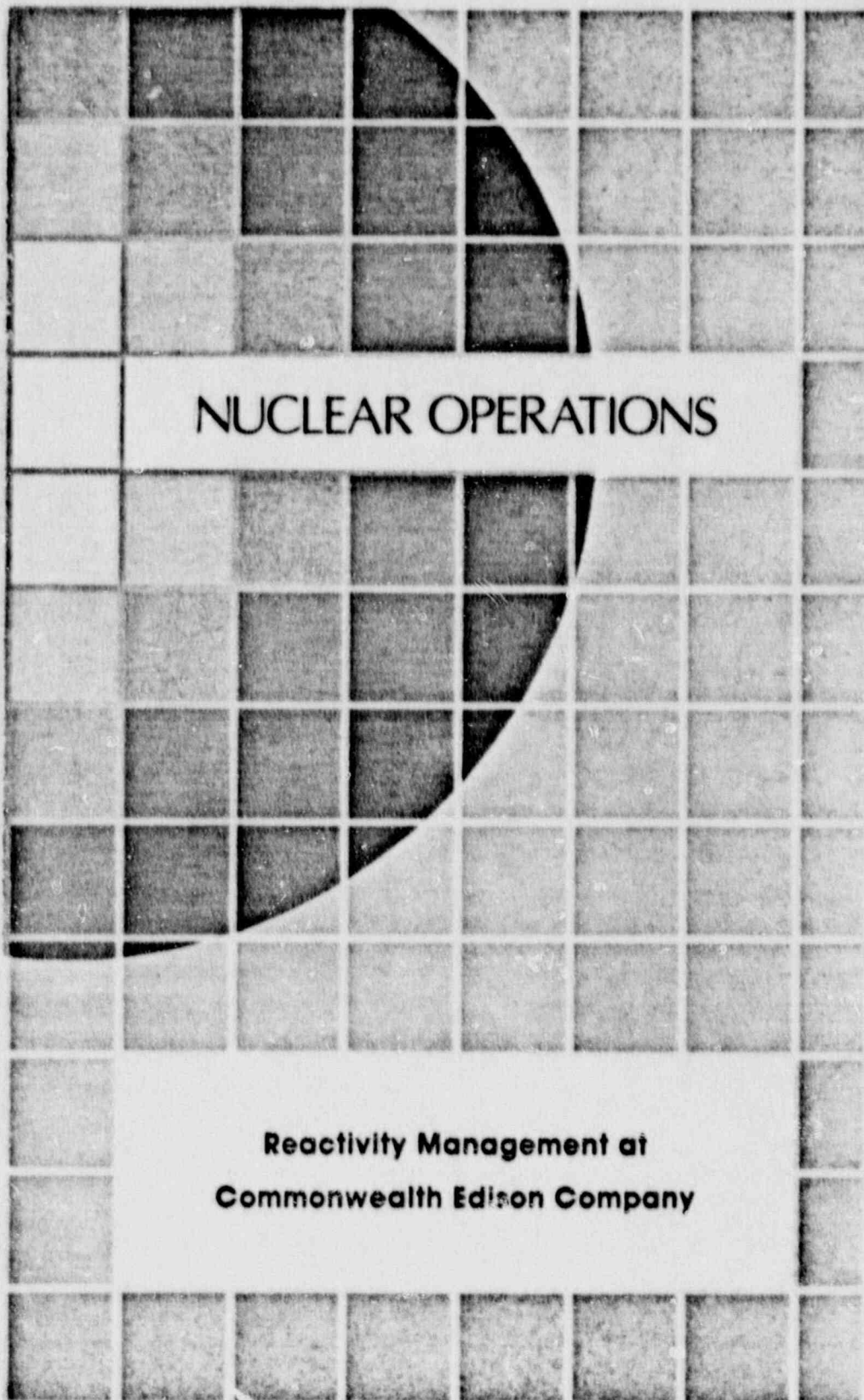
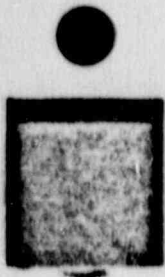
NUCLEAR OPERATIONS

**Reactivity Management at
Commonwealth Edison Company**



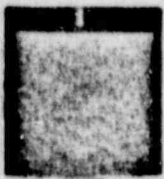
● ● The fundamental principle of safe nuclear operations must be that if an operating crew sees something unusual or unexplainable in core reactivity, or if procedures do not cover a situation, it is always appropriate to take the immediate conservative action of manually scrambling the unit. ● ●

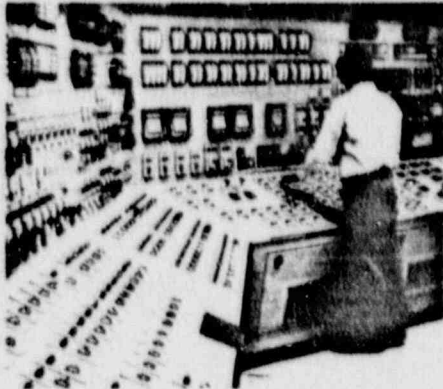
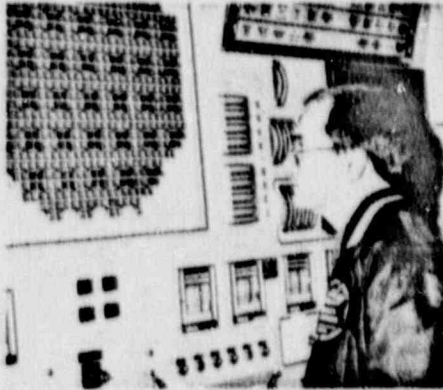
Cordell Reed
Senior Vice President



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Cordell Reed
Senior Vice President

Philosophy

Our mission in Nuclear Operations is to generate electricity safely, efficiently and in a cost-effective manner, while complying with all regulatory requirements and meeting our system's ever-changing load demands.

But safety comes first. Everything else is meaningless if we fail to conduct our business in a safe, responsible manner. And foremost in our concern for safety must be reactivity management.

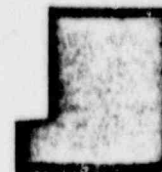
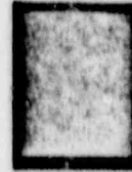
Reactivity management comprises all aspects of how we operate and handle nuclear fuel. At Commonwealth Edison, our philosophy of reactivity management demands that:

- all planned reactivity changes are conducted in a controlled manner;
- the effects of reactivity changes are known and monitored; and
- any anomalous indication is met with conservative action.

To meet these goals, we have committed ourselves to achieving excellence in our nuclear operations. Excellence requires that individual responsibilities under this philosophy be clearly defined, that our operations departments and our nuclear engineers acquire and exchange the best available technical information accurately and promptly, and that our high level of training and qualification for personnel responsible for reactivity management be strengthened even further.

In particular, we must ensure that the operations line management at our generating stations understand their individual responsibilities for carrying out this philosophy. We must also ensure that the nuclear engineering staffs at our stations and the Nuclear Fuel Services Department provide the accurate, timely information needed by operations to meet these goals.

Through constant vigilance, improved procedures and training, and an overall conservative approach to operations, Commonwealth Edison is committed to providing the highest calibre of reactivity management in the nuclear industry today. Nothing less will do.



Highlights of Our Philosophy at Work

Q. Who "owns" the reactor core at Commonwealth Edison nuclear stations?

A. From the Station Manager to the Nuclear Station Operator (NSO), ownership of the reactor core is shared by all operating personnel.

Two individuals, however, have greater responsibility for the reactor core and share ownership on a daily basis:

- The Nuclear Station Operator is responsible for operating the station so that the reactor core is within all limits and guidelines set by technical specifications and plant procedures.
- The Station Nuclear Engineer is responsible for ensuring that the operation of the reactor core is compatible with the cycle goals and that the fuel remains within its design basis.

Q. One of the greatest challenges of reactivity management is the startup of a nuclear reactor. Who oversees this activity at a Commonwealth Edison nuclear station?

A. The Station Manager, Production Superintendent, and Assistant

Superintendent of Operations oversee plant startup operations and are notified of any unusual conditions, according to station procedures. The Station Manager or his designee must approve reactor startup.

To do so, the Station Manager evaluates the plant status as presented by the Shift Engineer based on completed pre-startup checklists, procedures and operating instructions. In addition, a Nuclear Engineer is present during startup at the approach to criticality to provide additional technical expertise.

To ensure clear communications during this process, the Assistant Superintendent of Operations provides instructions to the control room crew via approved procedures and daily written shift orders. The Shift Engineer typically discusses this information with the Unit Operating Engineer, who is responsible for the operation of his assigned units.

If the startup is following a refueling outage:

- The Station Manager, or a Superintendent as his designee, participates in the "Readiness for Startup" on-site review.
- The Unit Operating Engineer discusses any special considerations

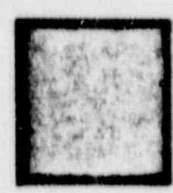
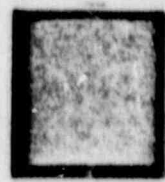
of the on-site review with the operating crew.

Q. "Doing things by the book" is one of the basic tenets of reactivity management. Who has the authority to deviate from established routines?

A. In the case of:

- **Adjustments to nuclear instrumentation**, the Shift Engineer has the authority to approve adjustments within the constraints of approved station procedures.
- **Safety system setpoints**, changes are only made within the constraints of the station technical specifications and are performed using approved procedures.
- **Automatic control systems that protect the reactor core**, bypass may be authorized by the Shift Engineer when allowed by plant technical specifications and approved station procedures. Under abnormal conditions, the operator may bypass automatic systems within the guidance of approved abnormal and emergency operating procedures. However, the technical specifications must be met and equipment must remain in the operating mode, except

for rare, unforeseen circumstances when literal adherence to technical specifications may cause additional problems.



Overview of Reactivity Management Functions

The **Station Manager** must:

- Set the tone for conservative reactivity management at the station by requiring procedure adherence, conservative response to abnormal events, and operator diligence.
- Make major decisions, such as unit startup or restart.
- Notify the Vice President or General Manager of PWR or BWR Operations of any abnormal reactivity events.

The **Production Superintendent** must:

- Implement the station reactivity management policy in administering the Production Department.
- Notify the Station Manager of any abnormal reactivity events.

The **Technical Superintendent** must:

- Implement the station reactivity management policy in administering the Technical Department.
- Ensure the Nuclear Group's active involvement in reactivity management.

The **Assistant Superintendent of Operations** must:

- Ensure adequate operator training on reactivity management.
- Review scrams and reactivity events to determine causes and prevent recurrence.
- Notify the Station Manager and Production Superintendent of any abnormal reactivity events.

The **Operating Engineer** must:

- Set the tone for conservative reactivity management during daily operations.
- Review reactor core operation, control rod sequences/operating limits, and nuclear fuel handling, as appropriate per individual station procedures.
- Review scrams and reactivity events to determine causes and prevent reoccurrence.

The **Shift Engineer** must:

- Set the tone for conservative reactivity management in the control room by requiring procedure adherence, conservative response to abnormal events, and operator diligence.
- Review reactor core operations, including thermal limits, rod pattern/control bank position, nuclear instrumentation response, and flow control line/boron concentration.
- Notify the Assistant Superintendent of Operations and the Operating Engineer of abnormal reactivity events.

The **Shift Control Room Engineer** must:

- Implement the station reactivity management policy in the control room.
- Review reactor core operations.
- Ensure control room conduct is professional and conscientious.

The **Nuclear Station Operator** must:

- Act professionally and implement the station reactivity management policy by following procedures, responding conservatively to abnormal events, and maintaining diligence.
- Monitor reactor core operation, including thermal limits, rod pattern/control bank position, nuclear instrumentation response, and flow control line/boron concentration.
- Take conservative action, including manual reactor scram, when abnormal reactor conditions occur.
- Alter core reactivity using approved station procedures.
- Ensure refueling activities are conducted properly—maintaining communications and monitoring nuclear instrumentation.

The **Nuclear Engineer** must:

- Implement the station reactivity management policy by providing conservative advice on actions affecting reactivity.
- Review reactor core operation regarding thermal limits, rod patterns/control bank positions, nuclear instrumentation response, and flow control line/boron concentration.
- Act as technical authority on reactivity management.
- Participate in startups, scram/rod drop testing, core loading and core unloading.

- Review operating procedures and training to prevent unplanned criticals, and fuel failures from operation outside thermal limits.
- Provide critical predictions for startup.
- Maintain technical proficiency, including training under the Qualified Nuclear Engineer program.

The **Fuel Handling Foreman** must:

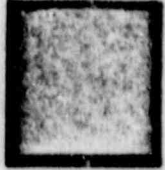
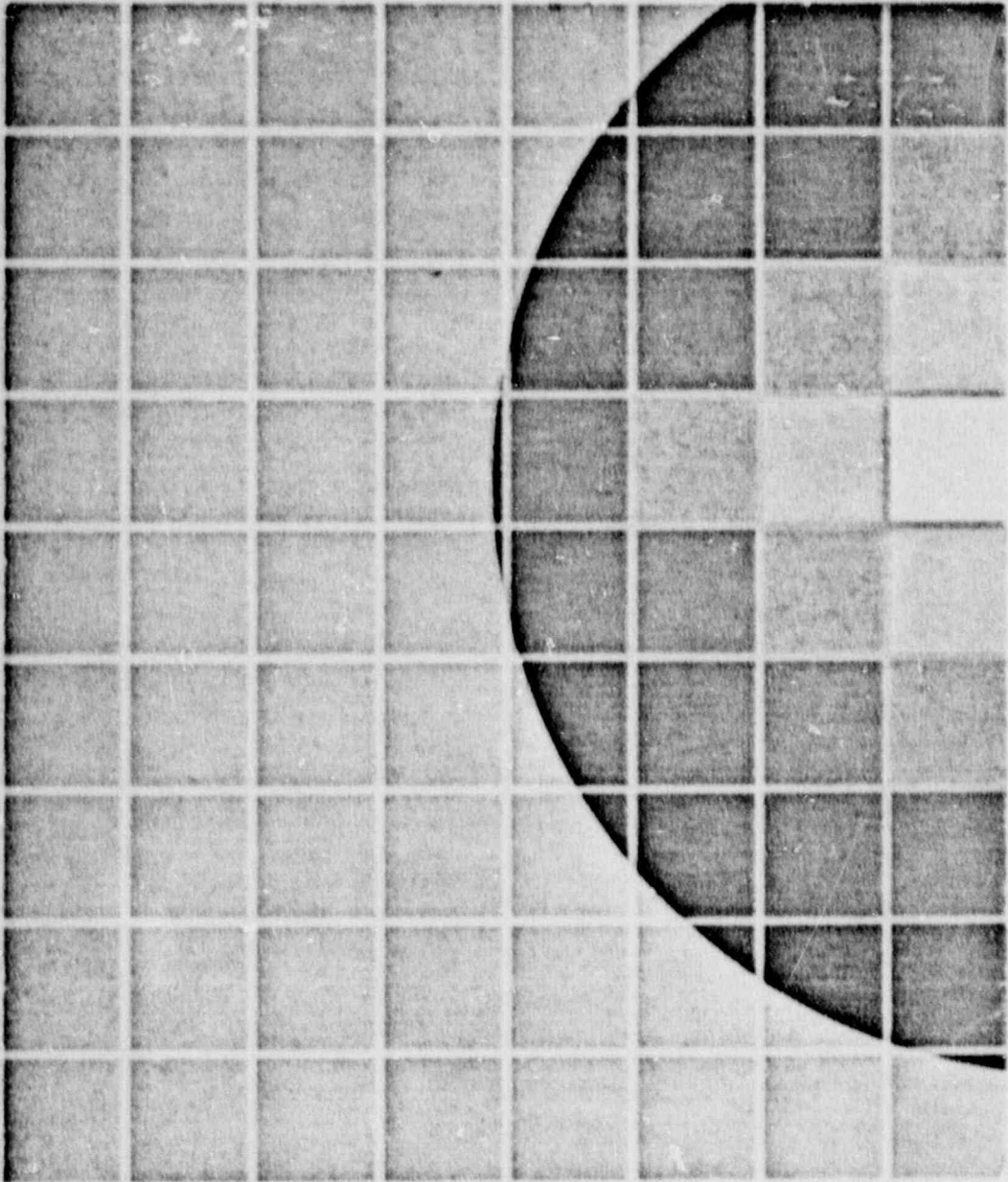
- Set the tone for conservative reactivity management during refueling and any fuel handling by requiring procedure adherence, conservative response to abnormal events, and operator/fuel handler diligence.
- Direct fuel movement and receipt.
- Test refueling interlocks.
- Ensure proper training of fuel handlers.

The **Training Supervisor** must:

- Provide adequate operator training on reactivity management.
- Review simulator training and training scenarios for accuracy.

The **Nuclear Fuel Services Manager** must:

- Act as corporate technical authority on reactor cores and reactivity management.
- Approve fuel and core designs.
- Review and assist Nuclear Engineer training.
- Review training material for technical accuracy.



Commonwealth Edison Company

