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Mr. Paul Collins

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Iowa Elec. Light & Pwr. Co.  
Cedar Rapids, Iowa  
Daniel L. Mineck

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Consists of the proposed Duane Arnold  
Energy Center Operating Training Program,  
Revision 3.....PLANT NAME : Duane Arnold  
RJL 11/29/77

(1-P)

(13-P)

40 ENCL/REPRO LTR'S

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PROJECT MANAGER:

LIC. ASST:

ASSIGNED AD:

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BRANCH CHIEF:

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IOWA ELECTRIC LIGHT AND POWER COMPANY

DUANE ARNOLD ENERGY CENTER  
P. O. Box 351  
Cedar Rapids, Iowa 52406  
November 18, 1977  
DAEC - 77 - 577



Mr. Paul Collins  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: Duane Arnold Energy Center Operator  
Training Program  
File: A-205d

Dear Mr. Collins:

Please find enclosed for your review the proposed Duane Arnold Energy Center Operator Training Program, Revision 3. The package contains one (1) original and 39 copies for your use. The document has been revised to reflect the changes Mr. Ralph Cooley requested.

Please review the enclosed training programs at your convenience and advise us of your comments and/or approval of the proposed changes.

Very truly yours,

A handwritten signature in cursive script that reads 'Daniel L. Mineck'.

Daniel L. Mineck  
Assistant Chief Engineer  
Duane Arnold Energy Center

DWK/DLM/nf

cc: E. Hammond  
D. Wilson  
D. Kalavittinos

Encl. Operator Training Program

773330144

DUANE ARNOLD ENERGY CENTER

OPERATOR TRAINING PROGRAM

Revision' 3

Date November 21, 1977

## INTRODUCTION

### 1. Purpose:

To set forth a program by which holders and prospective holders of Nuclear Regulatory Commission Reactor Operator and Senior Reactor Operator licenses will be trained for initial and subsequent renewal licensing.

### Discussion:

The DAEC Operator Training Program is divided into two separate sections. The first of these is the Operator Initial License Training Program. This program is designed to give unlicensed personnel the knowledge and experience necessary to meet the standards set forth in Federal Regulations for license application.

The second section of this training program is the Licensed Operator Retraining Program. This program will be conducted in order to maintain operator proficiency at a high level. It is designed to meet or exceed the requirements of 10CFR55, Appendix A.

Initial License Training Program

As the need for additional NRC licenses at DAEC arises, an Operator Initial License Training program will be initiated. The length and content of this program will be dependent on the individual's previous training and experience but will ensure that sufficient training and experience is obtained. The program will consist of the following:

References

NUREG - 0094

ANSI 18.1-1971

Program Index

- A. Experience Requirements
- B. Classroom Instruction
- C. On-Shift Instruction
- D. Simulator Instruction
- E. Review and Evaluation
- F. Documentation

A. Experience Requirements

a) Supervisors:

Supervisors shall meet the experience requirements of ANSI N18.1-1971, Section 4.3.1 and have a minimum time of six months on site.

b) Operators:

Operators shall meet the experience requirements of ANSI N18.1-1971, Section 4.5.1 and have a minimum time of six months on site.

## B. Classroom Instruction

The Initial Reactor Operator License Training program will normally require 500 hours of formal classroom training. However, credit for previous experience or education will be permitted on an individual basis. The classroom instruction will cover the following subject areas:

### Reactor Operator

- a) Principles of reactor operation
- b) Facility design features
- c) General operating characteristics
- d) Instrumentation and control systems
- e) Safety and emergency systems
- f) Standard and emergency operating procedures
- g) Radiation control and safety provisions

### Senior Reactor Operator

- h) Reactor Theory
- i) Handling and disposal of and hazards associated with radioactive materials
- j) Specific operating characteristics
- k) Fuel handling and core parameters
- l) Administrative procedures, conditions and limitations

Periodic quizzes shall be administered throughout the classroom training and records maintained such that the candidate's progress may be evaluated and adjustments can be made to the programs as necessary.

## C. On-Shift Instruction

- a) The Training Coordinator will develop a schedule of on-the-job

training. This schedule will consist of the manipulation of representative number of in-plant controls and equipment. This schedule will be completed on-shift over a period of three months or less, dependent on the individual's previous experience.

- b) Actually manipulate the controls of the facility in such a manner as to obtain five (5) approved significant reactivity manipulations. The approved reactivity manipulations and the method of documentation are contained in Section 5.0 of the Training Programs Administrative Manual. Every effort will be made to obtain a diverse collection of reactivity manipulations.

#### D. Simulator Instruction

A simulator training program approved by the NRC will consist of a minimum of one (1) week's training. This training program will ensure that the individuals attending the simulator demonstrate the following:

- (1) The ability to manipulate the controls and keep the reactor under control during a reactor startup.
- (2) The ability to predict instrument response and use the instrumentation during a reactor startup.
- (3) The ability to follow the facility startup procedures.
- (4) The ability to explain alarms and annunciators that may occur during the reactor startup.

The certification attesting to the satisfactory accomplishment of the above will be forwarded to NRC.

E. Review and Evaluation

A minimum of forty (40) hours for review, audit examinations and evaluation will be used to identify any problem areas that may exist for each individual. An attempt will be made to correct any problems that are identified during this time.

F. Documentation

The Training Coordinator will be responsible for maintaining the following documentation:

- (1) Lecture attendance records
- (2) Examinations and quizzes
- (3) On-shift experience schedule
- (4) Simulator certification
- (5) License evaluation

The above documentation will be maintained in each individual's training record.

When personnel receive a license from NRC, a copy of that license and any report from NRC pertaining to the person's deficient areas on the examination will be placed in the individual's training record. The licensed individual will then be enrolled in the Licensed Operator Retraining Program.



III.

Licensed Operator Retraining Program

The purpose of this program is to provide a comprehensive retraining program for all persons currently holding NRC operating licenses. This document has been prepared to present the scope and details of the retraining program and presents the material that will be included in the program as required by the Code of Federal Regulations, Part 55, Appendix A.

References

10CFR, Part 55

Program Index

- (a) Annual Written Examination
- (b) Lecture Series
- (c) Document Review
- (d) On-shift Training
- (e) Performance Evaluations
- (f) Prolonged Absence from Licensed Duties
- (g) Records

A. Annual Written Examination

An Annual Written Examination will be administered to each licensed operator or senior operator. This examination will be comparable in content and depth to NRC licensing examinations.

The Reactor Operator examination categories will be:

- a) Principles of Reactor Operation

- b) Features of Facility Design
- c) General Operating Characteristics
- d) Instruments and Control
- e) Safety and Emergency Systems
- f) Standard and Emergency Operating Procedures
- g) Radiation Control and Safety

The Senior Operator examination categories will be:

- h) Reactor Theory
- i) Radioactive Material Handling, Disposal and Hazards
- j) Specific Operating Characteristics
- k) Fuel Handling and Core Parameters
- l) Administrative Procedures, Conditions and Limitations

Individuals scoring greater than 80% on all categories of Annual Written Examination will not have to attend the lecture series. A grade of 80% or less on any category of the Annual Written Examination will require the individual to attend the lecture series on that category.

Individuals failing to achieve an overall examination grade of 70% will be relieved of his licensed duties in a timely manner and will be required to participate in an accelerated retraining program. A judgment will be made by the Assistant Chief Engineer, Operations Supervisor, and Training Coordinator at the time of failure as to how the accelerated program may best be administered.

The Assistant Chief Engineer and the Training Coordinator shall not be required to take the Annual Written Examination as they are directly involved in the preparation and approval process for the examinations.

Each licensed individual's graded examination will become part of their training file.

B. Lecture Series

In order to maintain high operator proficiency and effective response to normal and abnormal plant conditions, an on-site lecture series will be conducted. This lecture series will be dependent on operator performance on the previous Annual Written Examination. The indicated weak areas on the examinations will become prime topics for coverage during the lecture series. The lecture series will consist of the following general sections with the approximate time per section noted.

- |   |         |
|---|---------|
| a) Reactor Theory                               | (8 hrs) |
| b) Facility Design                              | (4 hrs) |
| c) Instrumentation and Control                  | (8 hrs) |
| d) Radiation Protection                         | (4 hrs) |
| e) Station Operating and Emergency Instructions | (8 hrs) |
| f) ECCS and their Performance                   | (8 hrs) |
| g) Specific Operating Characteristics           | (8 hrs) |
| h) Fuel Handling and Core Parameters            | (4 hrs) |
| i) Technical Specifications                     | (4 hrs) |
| j) Chemistry and Waste Disposal                 | (4 hrs) |
| k) Applicable Portions of 10CFR                 | (4 hrs) |

No more than 50% of the above lecture series will be supplemented by films, video tapes, or training slides.

Only individuals achieving a grade of 80% or less on categories of the Annual Written Examination shall be required to attend the lectures on those associated categories. Periodic examinations will be administered throughout the lecture series, a grade of 80% or greater is considered passing.

C. Document Review

This section of the program is used to ensure that all licensed personnel are made aware of the following:

- a) Revisions to the Operating Instructions
- b) Revisions to the Integrated Plant Operating Instructions  
(Emergency and Annunciator Response Instructions part of IPOI)
- c) Revisions to applicable Administrative Control Procedures
- d) Revisions to the Technical Specifications
- e) Revisions to the Facility Licenses
- f) Changes in the Plant Design
- g) Reportable Occurrence Reports for the facility

The Training Coordinator shall periodically schedule the documents to be reviewed. This shall ensure that an annual review of the Emergency Instructions is completed. These documents or reference to the documents will be contained in the Control Room Document Review Notebook and the Staff Document Review Notebook. All licensed personnel are required to complete the assigned document review. Upon completion

of the review personnel shall sign and date the document review sheet. This verifies they have completed the review of the documents and understands the contents.

The Training Coordinator shall periodically review the status of the document review notebooks to ensure personnel are accomplishing the required document review. Completed document review sheets will be maintained in the training files.

The group discussion method is encouraged for personnel on-shift, especially in the review of Emergency and Annunciator Response Instructions.

#### D. Operating Experience

Each licensed operator and senior is required to manipulate or direct the manipulation of at least ten (10) significant reactivity control changes. The significant reactivity control manipulations are required to be completed within the two (2) year license period.

The types of evolutions for which credit will be taken are listed below. Every attempt will be made to obtain a mixture of these evolutions.

## SIGNIFICANT REACTIVITY CONTROL MANIPULATIONS

1. Any reactivity change resulting in a controlled reactor startup to the point of adding heat or reactivity manipulations during a plant shutdown.
2. Any reactivity control manipulation which results in a controlled heatup or cooldown rate of  $\pm 50^{\circ}$  F/hr. or greater, when averaged over 1 hour.
3. Any reactivity control manipulation which results in an actual reactor thermal power change of 10% or greater.
4. Any movement of fuel into or from any core location.
5. Any use of an emergency procedure or transient condition where reactivity is changing.
6. Shutdown margin checks during core alterations.
7. Control rod drive scram and insertion tests.
8. Control rod sequence changes.

Significant Reactivity Manipulations will be documented by each licensed individual on their Operator Experience Form located in the Control Room. This information will be incorporated into the individual's training file.

### E. Performance Evaluation

Once per license period, each licensed individual will be systematically evaluated by the plant staff. This will be accomplished by the observation of licensed personnel's performance during routine operating conditions, emergency and abnormal operating conditions and any special operating conditions that may arise. This evaluation documentation will be placed in the individual's training file.

### F. Prolonged Absence from Licensed Duties

A prolonged absence is defined as a period of four (4) months or longer without involvement in licensed duties. Any licensed individual absent

from operating duties for a prolonged period will be given a written examination and/or an oral examination to determine any areas in which he needs accelerated training prior to his return to operating duties. In addition to the above mentioned examinations, he will be required to review any changes or reports on the following subjects:

- a) Operating Instructions
- b) Integrated Plant Operating Instructions
- c) Administrative Control Procedures
- d) Technical Specifications
- e) Facility License's
- f) Plant Design
- g) Reportable Occurrences

The above when accomplished will be documented and place in the individual's training file.

#### G. Record Retention

The Training Coordinator will be responsible for maintaining license holder retraining records. Records of the Retraining Program shall be maintained to document each individual's participation in the Retraining Program. Copies of the following records shall be maintained:

- a) Written examinations administered
- b) Answers given by licensee on examinations
- c) Results of evaluations
- d) Documentation of any additional training administered in areas in which a licensed individual has exhibited deficiencies.
- e) Reactivity Manipulation Record