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 RECI. NAME: RECIPIENT AFFILIATION
 TEDESCO, R. L. Assistant Director for Licensing

SUBJECT: Forwards proposed revisions to FSAR, Section 13.2 & LLUR responses re IMI Action Plan Items I.A.3.1 & II.B.4, per 810921 telcon. Affidavit encl.

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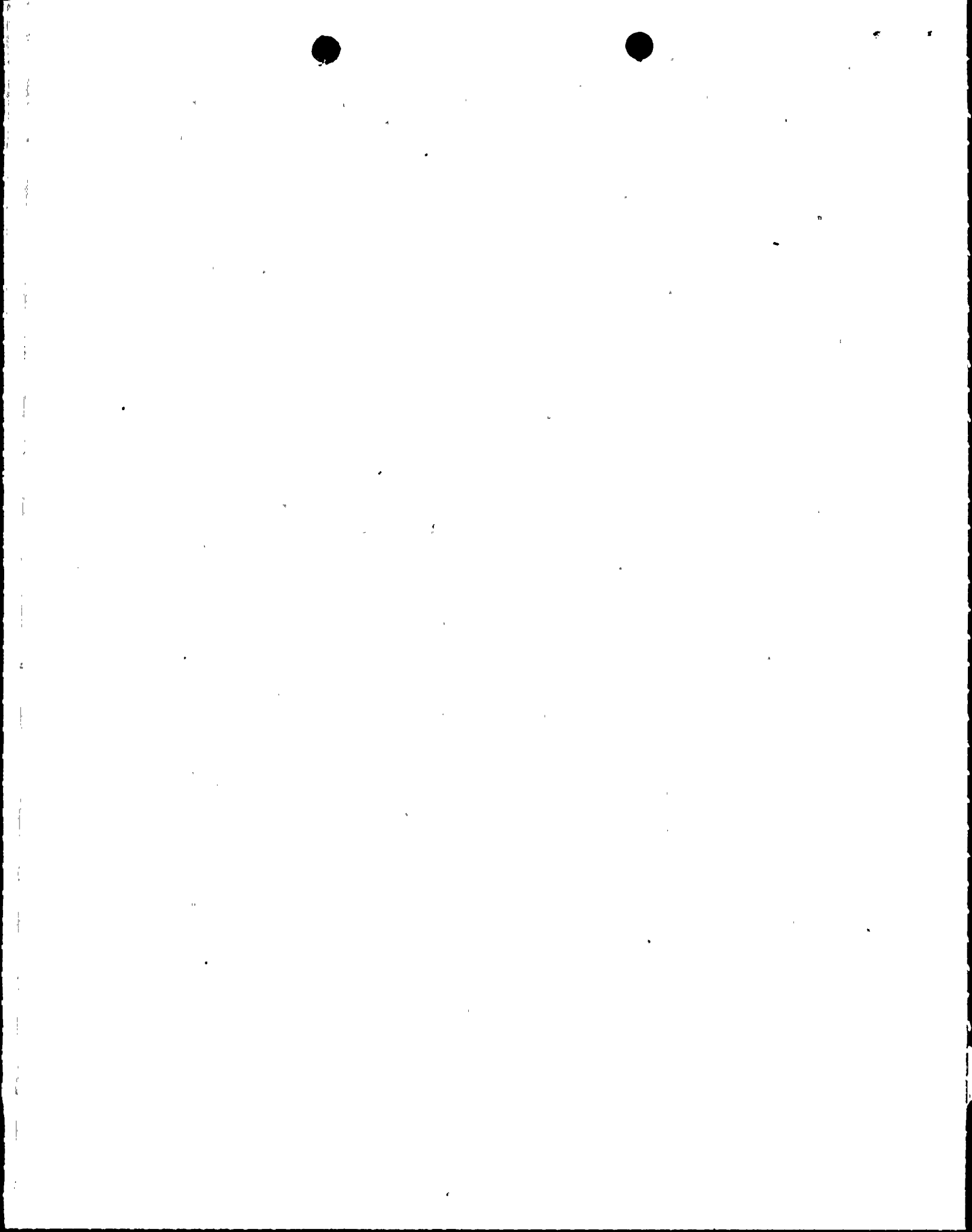
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P.O. BOX 21666 - PHOENIX, ARIZONA 85036

October 28, 1981
ANPP-19288 - JMA/WFQ

Mr. R. L. Tedesco
Assistant Director for Licensing
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555



Subject: Palo Verde Nuclear Generating Station
(PVNGS) Units 1, 2 and 3
Docket NOS STN-50-528/529/530
File: 81-056-026; G.1.10

Dear Mr. Tedesco:

Attached please find a revision to FSAR, Section 13.2 and revisions to our LLIR responses regarding Items I.A.3.1 and II.B.4 in response to a September 21, 1981, telecon with NRC's Operator Licensing Branch (OLB).

Very truly yours,

J. Allen for

E. E. Van Brunt, Jr.
APS Vice President,
Nuclear Projects
ANPP Project Director

EEVBJr/WFQ/sam
Attachment

cc: J. Kerrigan)
P. Hourihan w/a)
A. Gehr)

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PDR ADOCK 05000528
A PDR



STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, John M. Allen, represent that I am Nuclear Engineering Manager of Arizona Public Service Company, that the foregoing document has been signed by me for Edwin E. Van Brunt, Jr., Vice President Nuclear Projects, on behalf of Arizona Public Service Company with full authority so to do, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

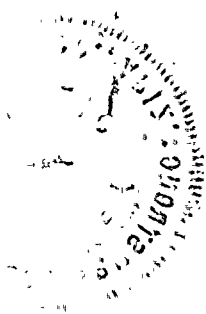
John M. Allen
John M. Allen

Sworn to before me this 29th day of October, 1981.

Connie Lou Armstrong
Notary Public

My Commission expires:

June 24, 1983



13.2 TRAINING

13.2.1 PLANT STAFF TRAINING PROGRAM

A training program for the staff of PVNGS has been developed based on the guidance provided in ANS 3.1 - 1978. This program will provide the necessary training and knowledge to supplement each individuals' background and experience, thus enabling him/her to perform competently and safely. The program will be periodically reviewed to assure that it continues to meet station needs.

Members of the PVNGS training staff who routinely provide instruction on systems related to plant safety, integrated responses, transients and simulator courses shall demonstrate their technical competence by successfully completing an approved training program. These instructors shall also be enrolled in appropriate requalification programs.

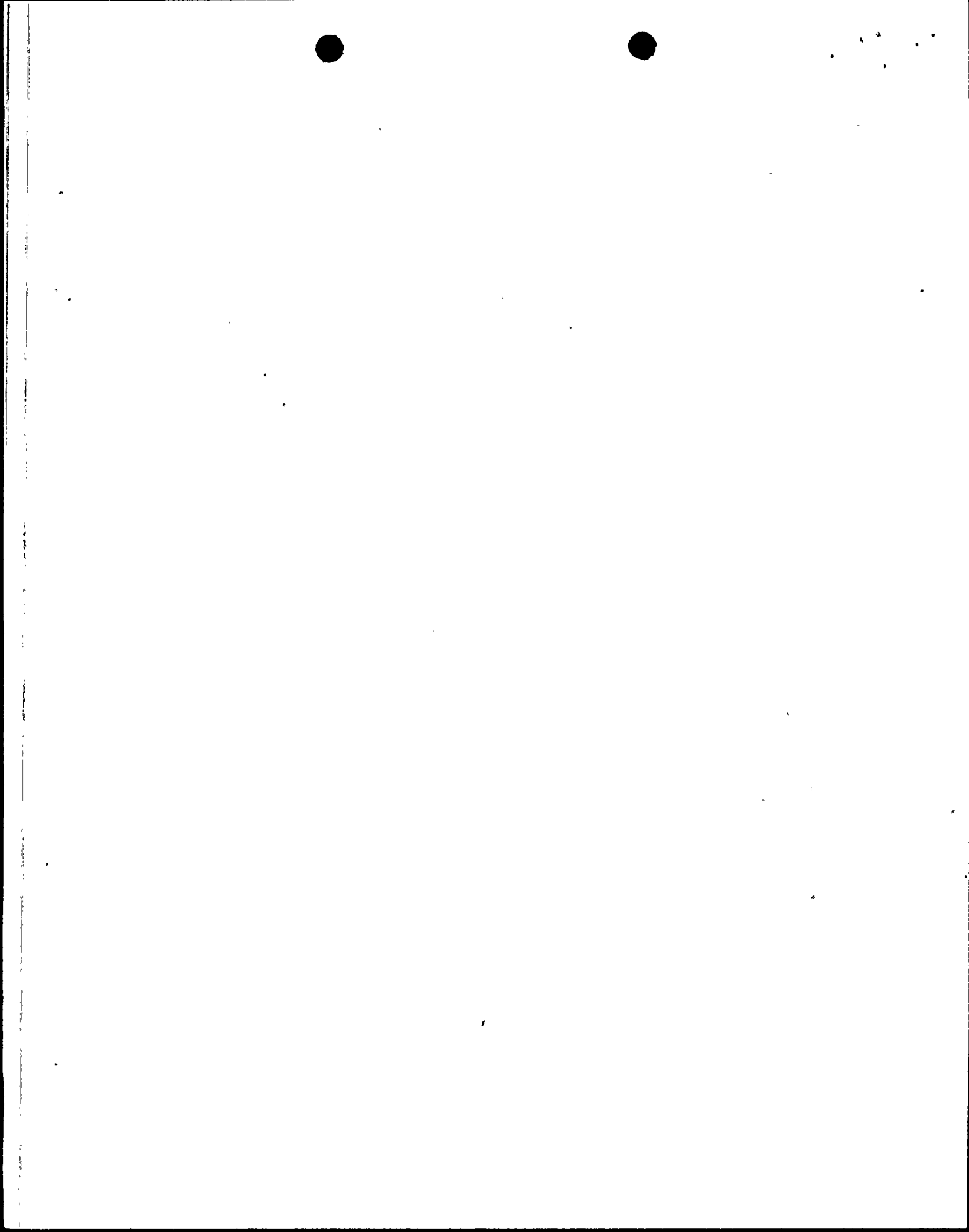
The PVNGS Training Manager, under the direction of the Manager of Nuclear Operations, has overall responsibility for the conduct and administration of the training program for staff personnel. Specific procedures for the conduct of this training is provided in the Station Manual.

13.2.1.1 Cold License Operator Training

The training program for the operator and senior operator cold license candidates is outlined in Table 13.2-1 and described in detail in the following paragraphs. Previously experienced operators may participate in a modified plant specific program determined by an evaluation of their education, training, and experience.

13.2.1.1.1 Nuclear Fundamentals

For the initial group of licensed operators the basic nuclear fundamentals program has consisted of 650 contact hours. This program has been taught on



site by the Center for Nuclear Studies of Memphis State University, supervised by the Training Department. The following courses were taught:

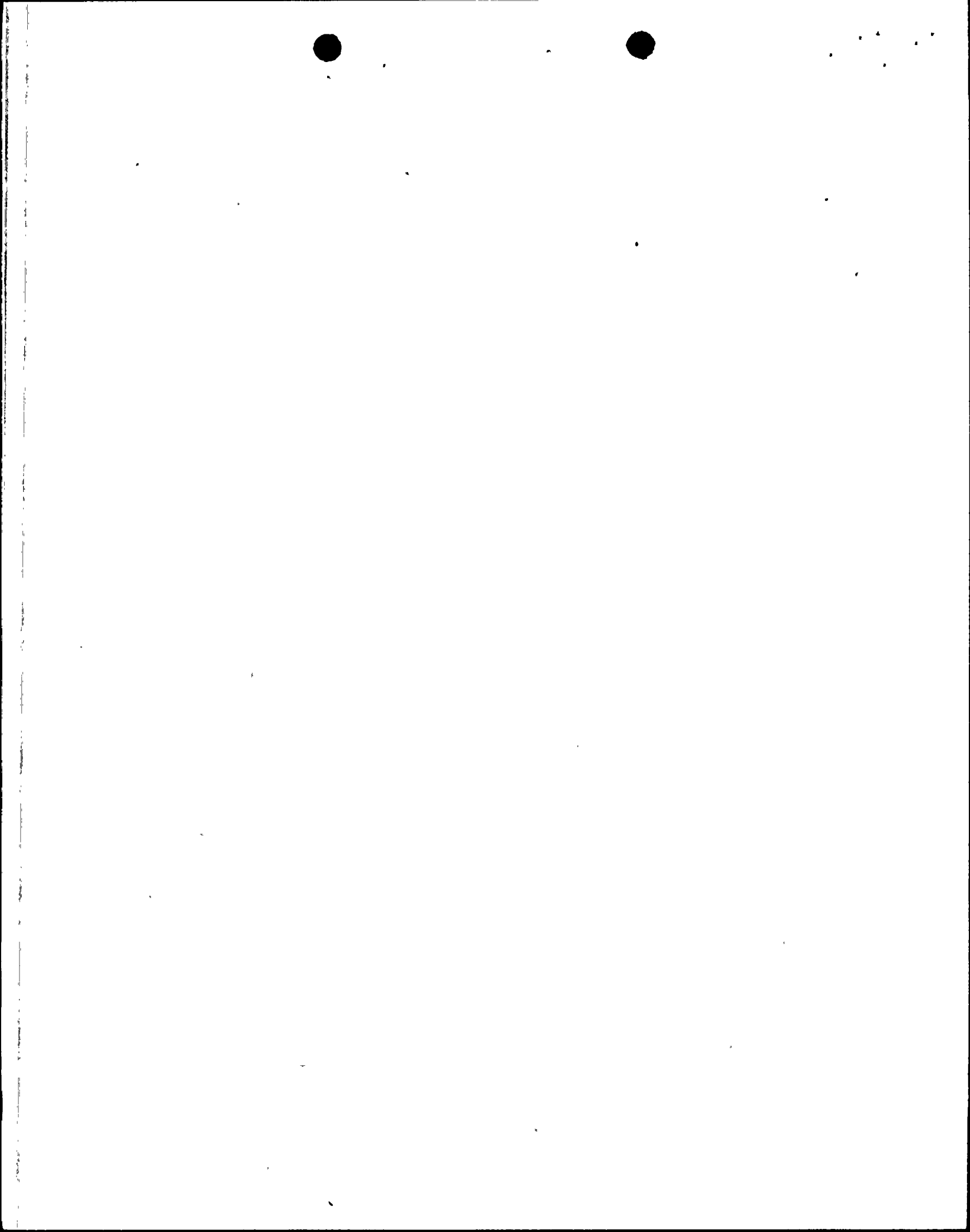
- Mathematics
- Physics-Mechanics
- Heat and Thermodynamics
- Fluids
- Electricity
- Nuclear Physics
- Instrumentation
- Chemistry and Materials
- Radiation Protection

Equivalent training will be provided to subsequent cold license operator candidates, modified to account for their previous training and experience.

13.2.1.1.2 Advanced Engineering Training

For the initial group of senior operator candidates the advanced program has consisted of 450 contact hours of instruction. It has been taught on-site by the Center for Nuclear Studies of Memphis State University, supervised by the Training Department. The following courses were included in this program:

- Differential Calculus
- Integral Calculus
- Materials Science
- Corrosion Chemistry
- Advanced Reactor Physics
- Thermodynamics I
- Thermodynamics II



Heat Transfer

Fluid Mechanics

Human Behavior

Equivalent training will be provided to subsequent cold license senior operator candidates, modified to account for their previous training and experience.

13.2.1.1.3 Research or Training Reactor Training

This one-week course provides operator experience in operating a research reactor, including observations of various responses and operations. It is offered by several vendors and universities. A minimum of 10 reactor startups and shutdowns are required as part of this training.

13.2.1.1.4 Observation Training

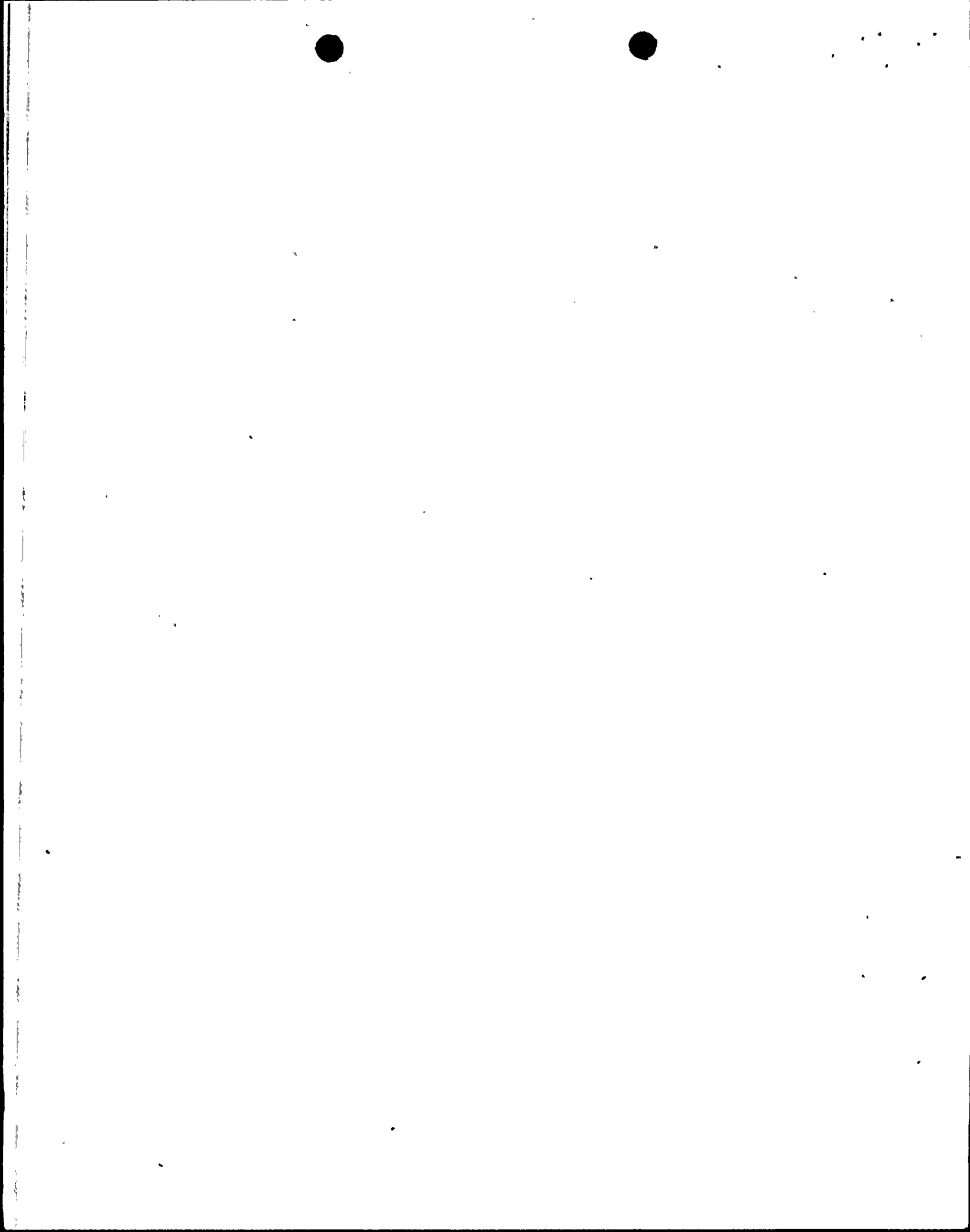
This ten-week course consists of assignment to an operating PWR to study and participate in the day-to-day operations, surveillance testing, administration, and radiological protection evolutions.

13.2.1.1.5 Nuclear Steam Supply Systems (NSSS) Training

This eight-week course has consisted of approximately 160 contact hours. It has been conducted on-site by Combustion Engineering, Inc., supervised by the Training Department. The Training Department or a consultant will conduct subsequent equivalent courses. In addition to lectures on the NSS Systems, training is given on core operating characteristics, thermal-hydraulics, LOCA, safety analysis, chemistry, NSSS response, and Technical Specifications.

13.2.1.1.6 Balance of Plant Systems

This six-week course has consisted of approximately 180 contact hours. It has been conducted on-site by General Electric and the Training Department staff.



The Training Department or a consultant will conduct subsequent equivalent courses. Training is given on the turbine-generator and related systems.

13.2.1.1.7 Simulator Training

PVNGS will take full advantage of the on-site, plant-specific simulator. This eight-week course is conducted by the Training Department staff and consists of approximately 50% classroom and 50% control room operations. Trainees perform control room operations under realistic conditions utilizing plant operating and emergency procedures. Operations conducted include startups, heatups, power escalation, power changes, shutdown, cooldown, abnormal and emergency conditions. The final stage of this training is conducted in a manner that permits integration of the training of reactor operators, shift supervisors and shift technical advisors.

13.2.1.1.8 Mitigating Core Damage

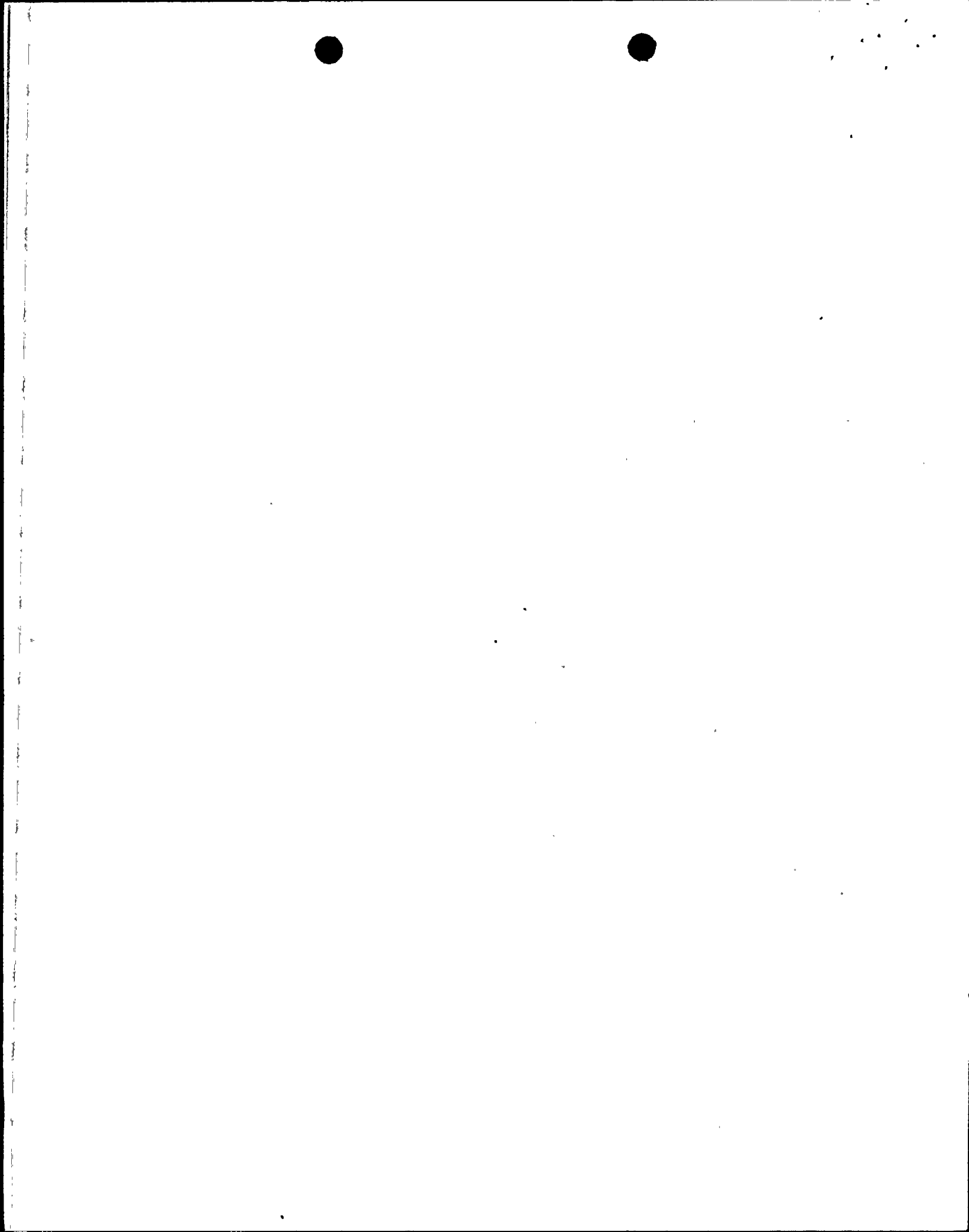
The training for the mitigation of core damage will be as described in Section II.B.4 of the LLIR.

13.2.1.1.9 On-The-Job Training

The schedule of the on-the-job training program for cold license candidates varies depending on when the individual completes the various portions of the formal training program. On-the-job training involves participation in startup testing, procedure preparation, and qualification on plant systems under the direction of the Operations Superintendent.

13.2.1.1.10 Review and Evaluation

This program will include written examinations and an evaluation of the candidate during a plant walkthrough. These evaluations will determine the content of a



subsequent three-week classroom review period. A one-week review and evaluation for each candidate will be conducted on the simulator. In the event fuel loading is delayed from the presently scheduled date, this program will either be delayed or repeated, depending the length of delay.

13.2.1.2 Low Power Testing and Coordination with Preoperational Tests

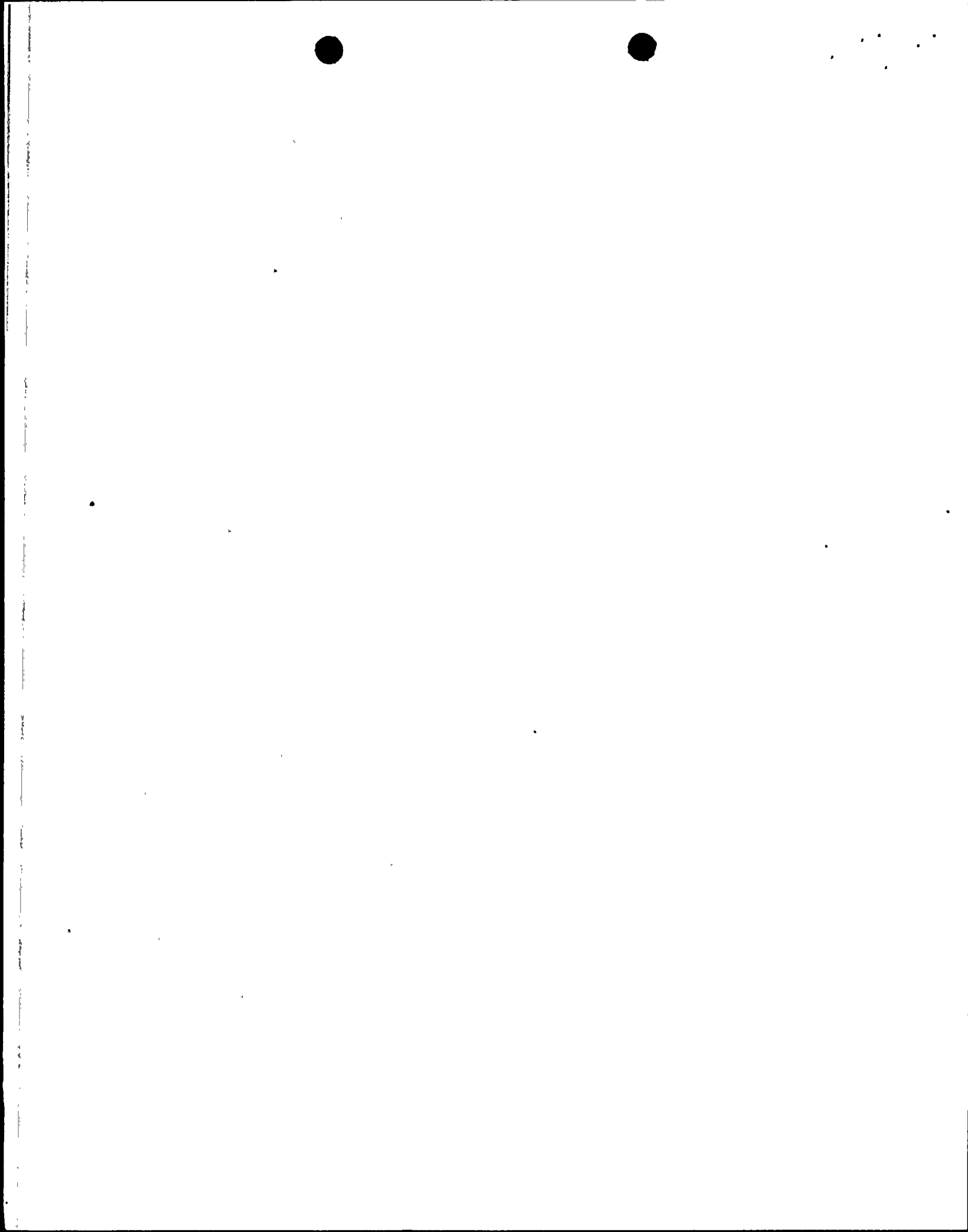
Plant licensed operating personnel shall participate in low power testing that cannot be satisfactorily conducted on the simulator. The extent of this participation will be that each shift crew will either operate the controls or observe such operations. This program is discussed further in Section I.G. of the LLIR.

Plant operating personnel will be used to the fullest extent practicable during the entire startup test program. The plant staff will operate permanently installed and powered equipment during preoperational and subsequent testing using approved operating and test procedures. Plant technical and maintenance personnel will be involved in testing applicable to their field of specialization.

13.2.1.3 Non-Licensed Personnel Training

13.2.1.3.1 Non-Licensed Operator Training

Non-licensed operators who independently operate systems or equipment important to safety, shall receive instructions for tasks to be performed. This training shall consist of a modified fundamentals course (Section 13.2.1.1.1) of approximately six weeks duration for those individuals without experience in nuclear power, plus extensive on-the-job training. The on-the-job portion shall provide



for qualification on specific equipment and system operation, responsibilities during transients, and watchstanding procedures.

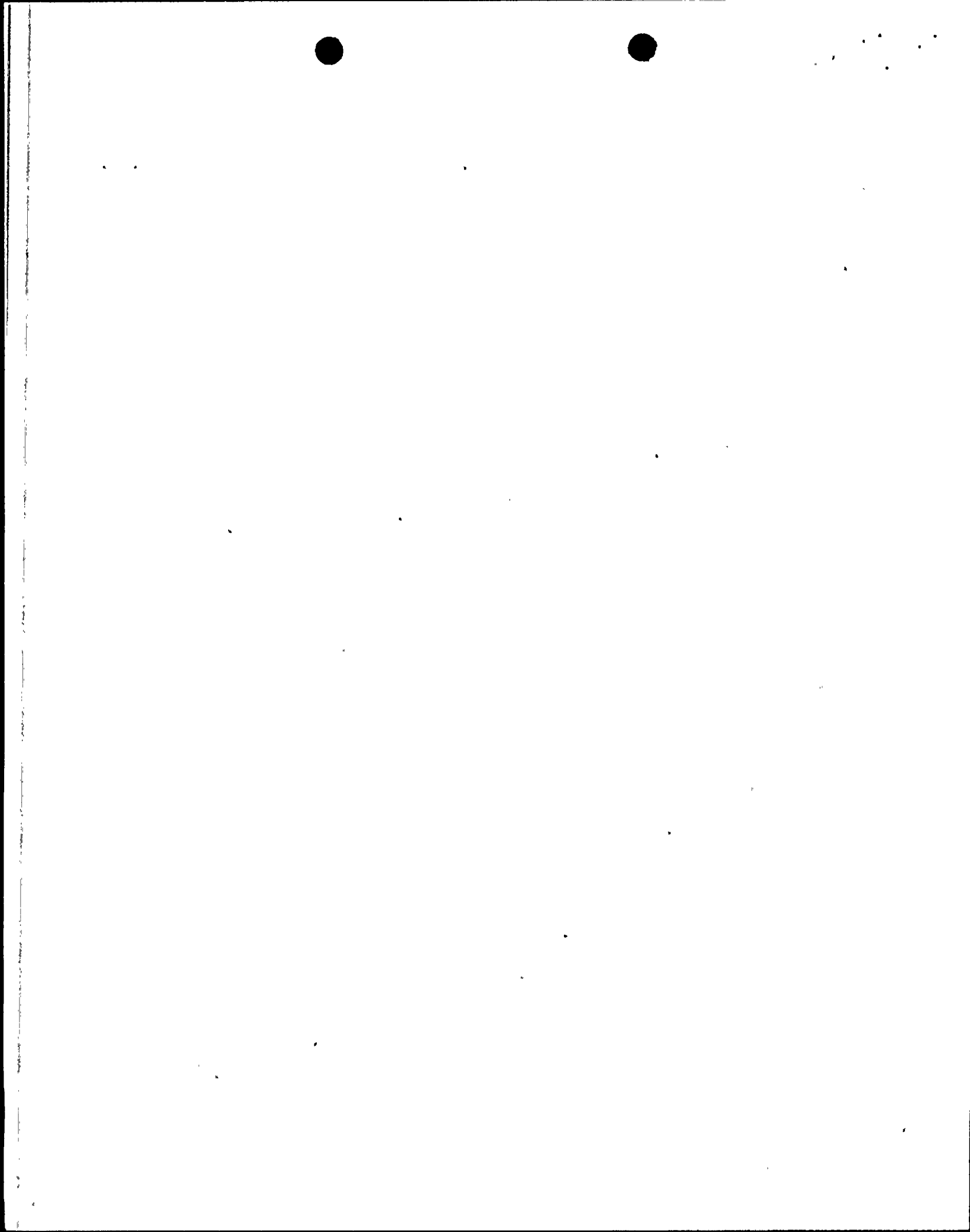
13.2.1.3.2 Shift Technical Advisor (STA) Training

The Shift Technical Advisors shall have, as a minimum, a Bachelor's degree in an engineering or science discipline. The STA shall have training in plant design and layout, including the capabilities of instrumentation and controls. The STA shall also have training in the response of the plant to transients and accidents, and in the analysis of transients and accidents. The training will be based on INPO guidelines and shall include the following elements:

- a. The applicable portions of Nuclear Fundamentals (Section 13.2.1.1.1) and Advanced Engineering training (Section 13.2.1.1.2). The applicable portions will be determined by the individuals' education and experience.
- b. Nuclear Steam Supply System Training (Sect. 13.2.1.1.5)
- c. STA Simulator Training. This training will consist of two weeks of familiarization and orientation training plus three weeks of training coordinated with the last three weeks of the operator Simulator training (Section 13.2.1.1.7)
- d. Systems and procedures training conducted as on-the-job training and self study to meet qualification requirements.

13.2.1.3.2 Professional-Technical Training

Professional-Technical personnel will receive technical training as required to meet the training requirements of ANS-3.1-1978 Section 5.3.3.



13.2.1.3.3 Non-Licensed Supervisor Training

Station supervisory personnel who are not candidates for an NRC license will be trained in the following areas commensurate with their functional level of responsibility:

- Power Block Systems

- Station Emergency Plan

- Job Related Radiation Protection

- Quality Assurance Program

- Procedures and Instructions

Additional specialty or related technical training will be given to assure that personnel meet the qualifications for their position.

13.2.1.3.4 Maintenance and Technical Personnel Training

Maintenance, instrumentation and controls, chemistry, and radiation protection personnel who perform work in the power blocks will be trained in the following areas as dictated by a comparison of their ability and background to the job skills required to perform their function:

- Power Plant Systems (Mechanical, Electrical and Control)

- Job Related Radiation Protection

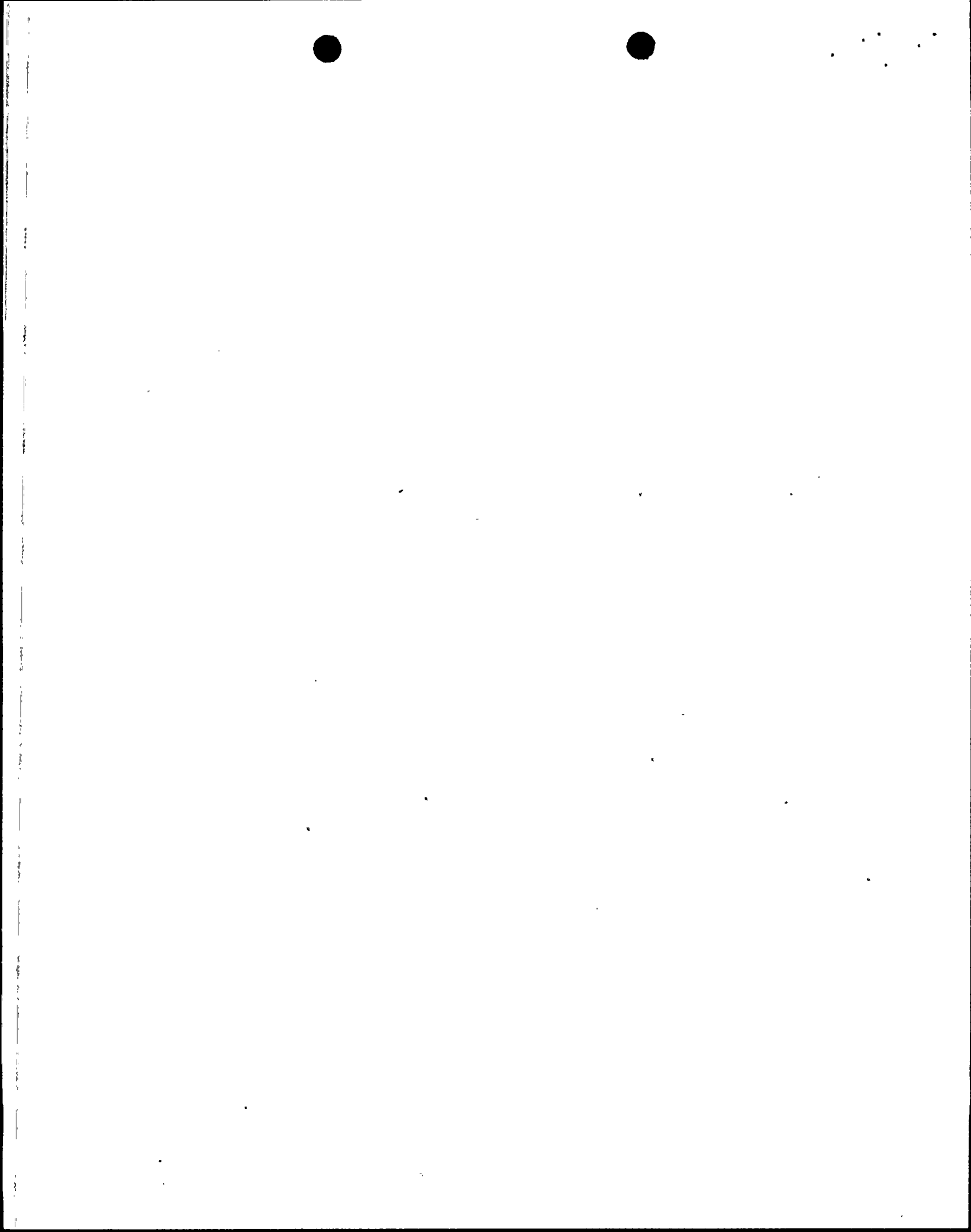
- Job Related Quality Assurance

- Job Related Skills, Procedures and Instructions.

This training will be accomplished by a combination of related technical training, on-the-job training and participation in initial calibration, testing and acceptance programs.

Specific training planned includes:

- Rigging and Crane Operations



Turbine Generator Control System Maintenance
NSSS Control System Troubleshooting and Repair
Diesel Generator Mechanical and Electrical Maintenance
Battery Charger and Inverter Maintenance
Foxboro Control System Maintenance

13.2.1.4 General Employee Training

Persons regularly employed at the station will be trained in the following topics, commensurate with their job duties and level of plant access:

General Facility Description

Job Related Procedures and Instructions

Radiological Protection

Station Emergency Plan

Industrial Safety

Job Related Fire Protection

Station Fire Protection Program

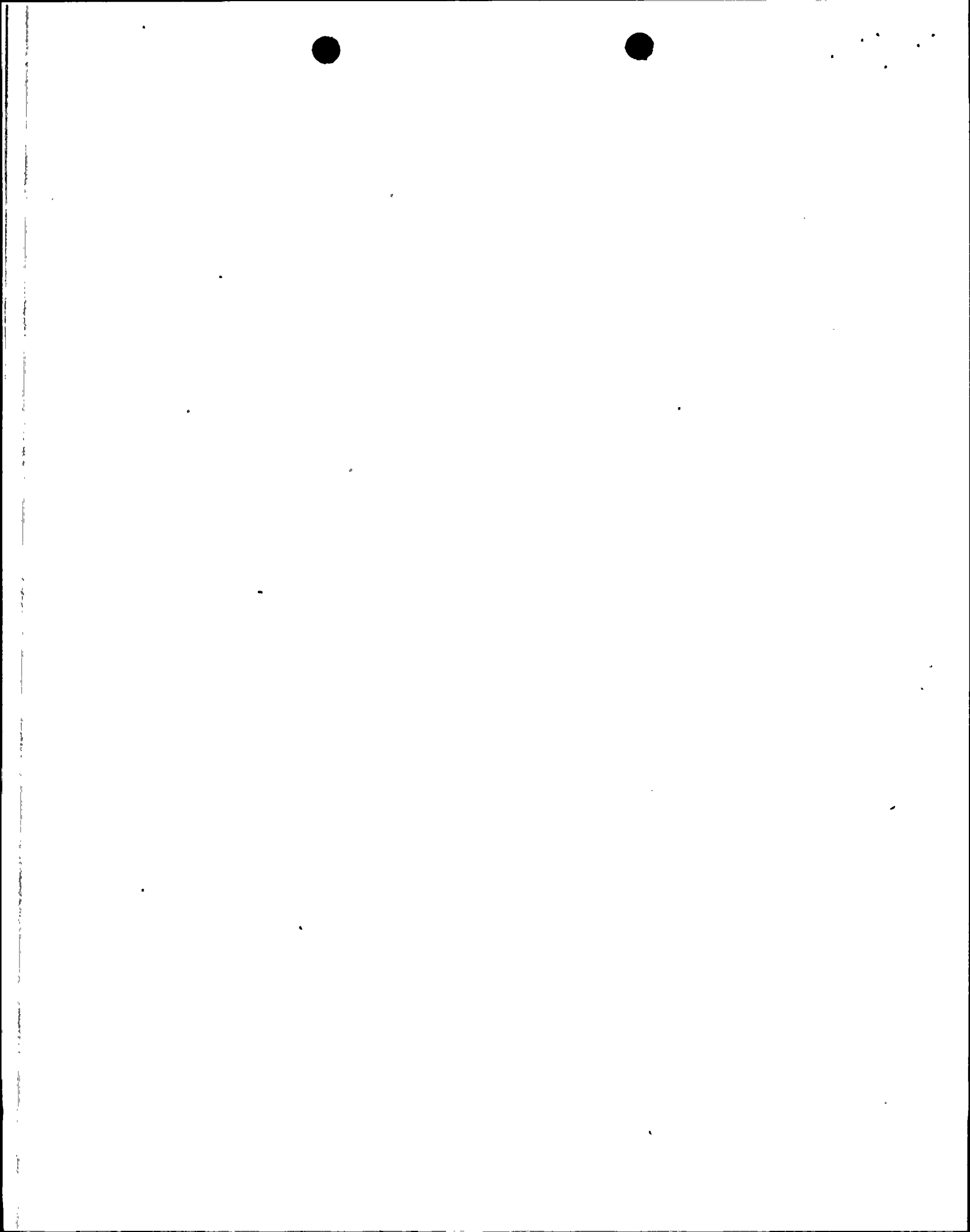
Security Program

Quality Assurance Program

To be authorized for unescorted unit access personnel must satisfactorily complete a written exam covering the above listed topics. Temporary personnel will receive training based on the extent of access required and their knowledge and experience, as validated by written examination.

13.2.1.5 Fire Protection Training

As a portion of General Employee Training, station personnel will be trained in the following aspects of fire protection as they apply to their specific job function:



Station Fire Protection Plan

Station Evacuation Routes

Fire Reporting Procedures

Job Related Fire Prevention and Suppression

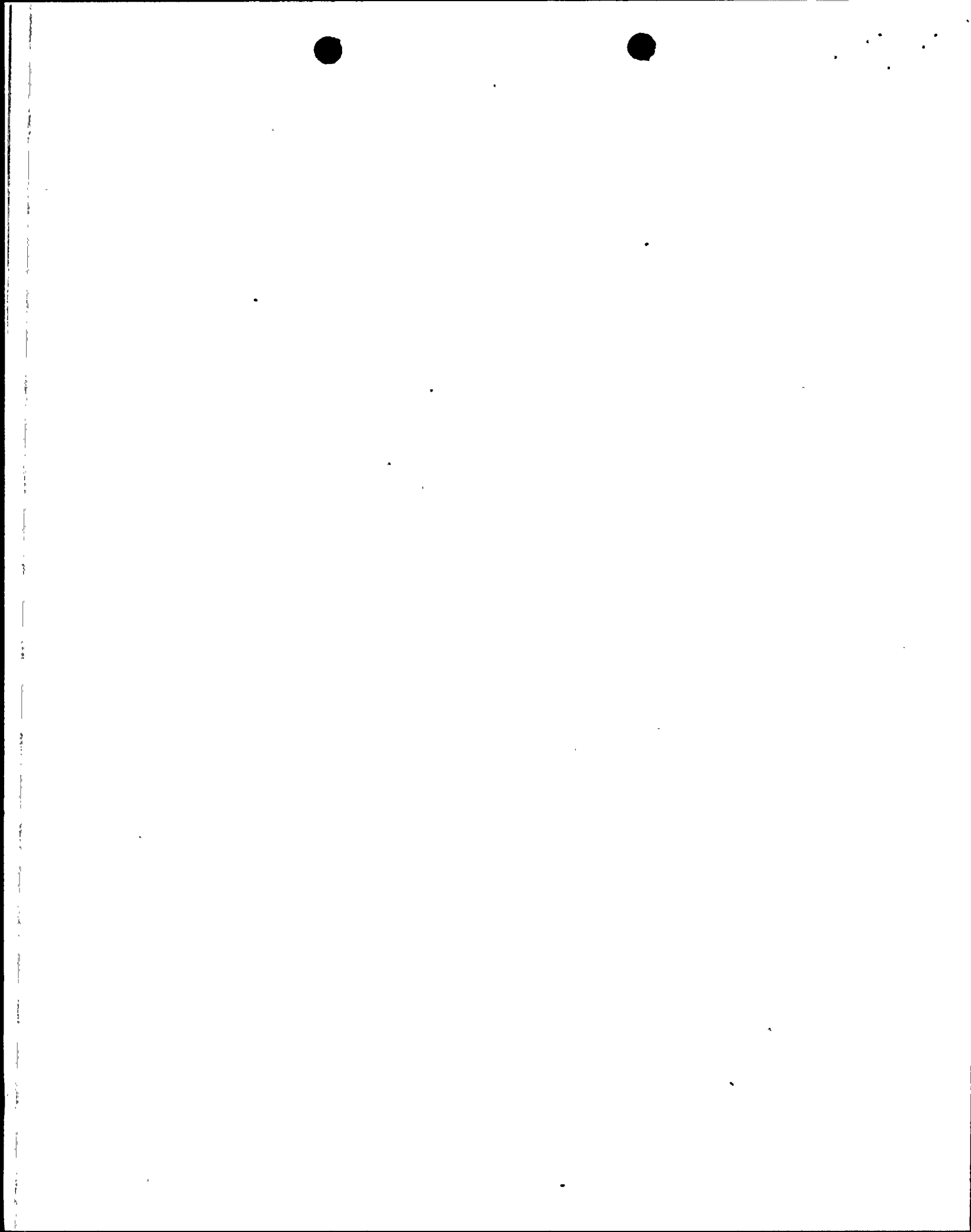
Prior to fuel loading, fire team members will be designated and will commence fire team training. The initial fire team complement will complete training prior to fuel loading.

Each member of the fire team will be trained in the following areas of fire protection: types of fires; fire hazards and hazard location; location of installed and portable fire fighting equipment and its proper use; correct method of fighting different types of fires; plant fire fighting plan; respiratory protection, communication, lighting, and portable equipment. Course length is approximately 20 hours.

In addition, fire team leaders will receive instruction in directing and coordinating fire team efforts. This training will be supervised by the Training Department.

Fire team members will have practice in the proper method of fighting various types of fires.. These sessions will involve extinguishing actual fires and will be provided at regular intervals not to exceed 1 year.

Team members will participate in practice sessions with protective equipment including respiratory equipment. Such training includes aspects of fighting fires complicated by the presence of radioactivity. These sessions will be provided at regular intervals not to exceed 1 year.

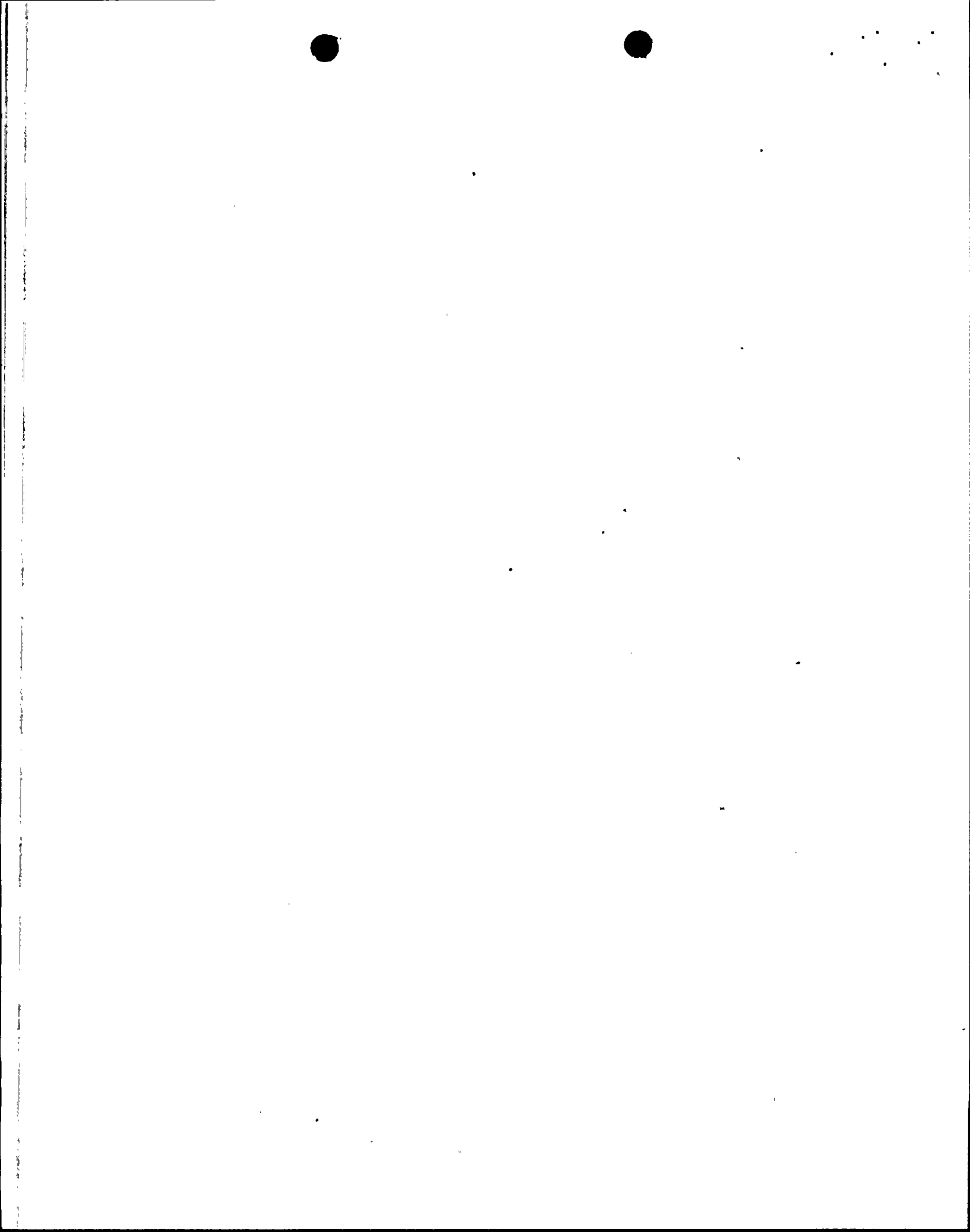


Practice drills are conducted quarterly to check the abilities of team members and other station personnel to perform the operations they are to carry out with the fire equipment provided. During these drills, equipment is operated whenever practical. Practice drills are carried out under the control of the fire team leader. Certain other station personnel onsite during the drills may participate under the direction of the fire team as required. At least one drill each year will be unannounced. Drills are assessed for effectiveness of the team, response time, use of proper equipment, and the team direction. Fire evacuation drills may be combined with emergency planning evacuation drills. Personnel temporarily assigned onsite duties during shutdown and maintenance outages will receive, as part of the training required for unescorted access, instruction on evacuation signals, evacuation routes, and procedures for reporting a fire. Course presentation will be by station supervisory personnel or Training Department personnel.

13.2.1.6 Training Program Evaluation

The performance of employees participating in the training program is monitored and evaluated. Written examinations and written performance evaluations of employees are used to determine the effectiveness of the training program and the performance of the participants. Action will be taken to correct deficiencies identified by these evaluations.

Extensive operating experience pursuant to 10CFR55.25 (b) is assured by providing the individuals seeking an operating license prior to criticality with simulator training and/or assignments at operating nuclear plants as described



in section 13.2.1.1.4. Following this program, the personnel will participate in preoperational testing and unit operation.

13.2.1.7 Emergency Diesel Generator Training

Persons assigned to operate, maintain, or test the emergency diesel generator will complete a course of instruction given by, or based on material provided by, the engine manufacturer. The requalification and refresher training described in section 13.2.2 will include ongoing training for emergency diesel generator operators, maintenance, and test personnel and will cover surveillance testing and operational or maintenance lessons learned, as appropriate, from industry and from PVNGS diesel engine experience.

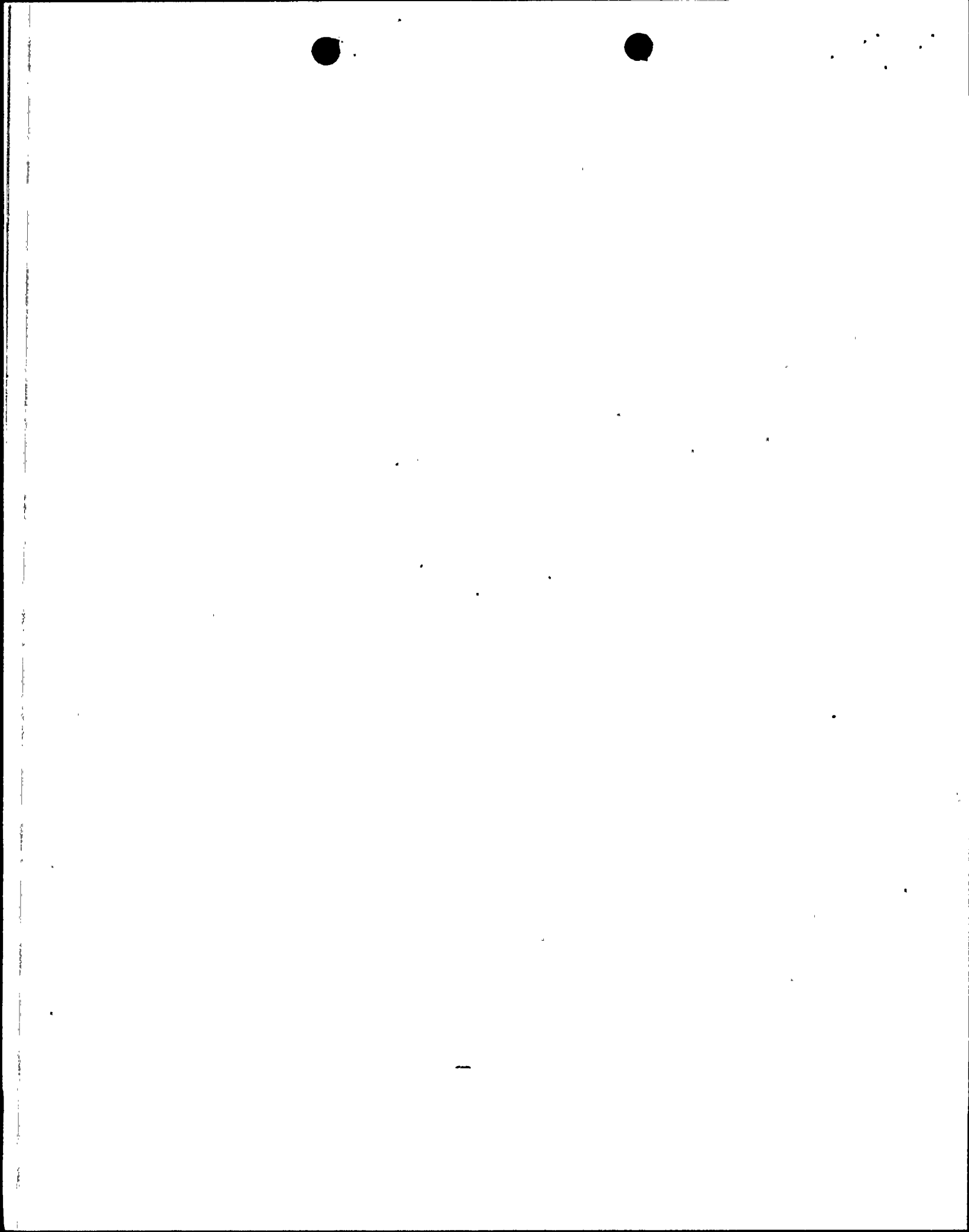
13.2.2 RETRAINING

A retraining program will be implemented which maintains the proficiency of the operating organization, particularly to respond to abnormal and emergency situations, through periodic training exercises, instruction, and reviews covering those items and equipment which relate to safety.

13.2.2.1 Requalification Training for Licensed Personnel

The requalification program will include lectures, on-the-job training, and evaluations on a regular and continuing basis. The plant specific PVNGS simulator shall be utilized to fulfill certain requirements of the requalification program.

Plant staff personnel who maintain a current Senior Operator or Operator license shall participate in the requalification program. The requalification program shall commence within three months after receipt of a plant operating license and be conducted on a two year, repeating cycle.



13.2.2.1.1 Lectures

A lecture series, consisting of at least six lectures, will be presented annually, consistent with plant schedule. Subjects and depth of coverage will be determined by evaluation of the annual evaluation examination results, oral interviews and practical demonstrations which indicate general weaknesses in operator knowledge. No more than 50% of the lecture series shall consist of videotapes and films.

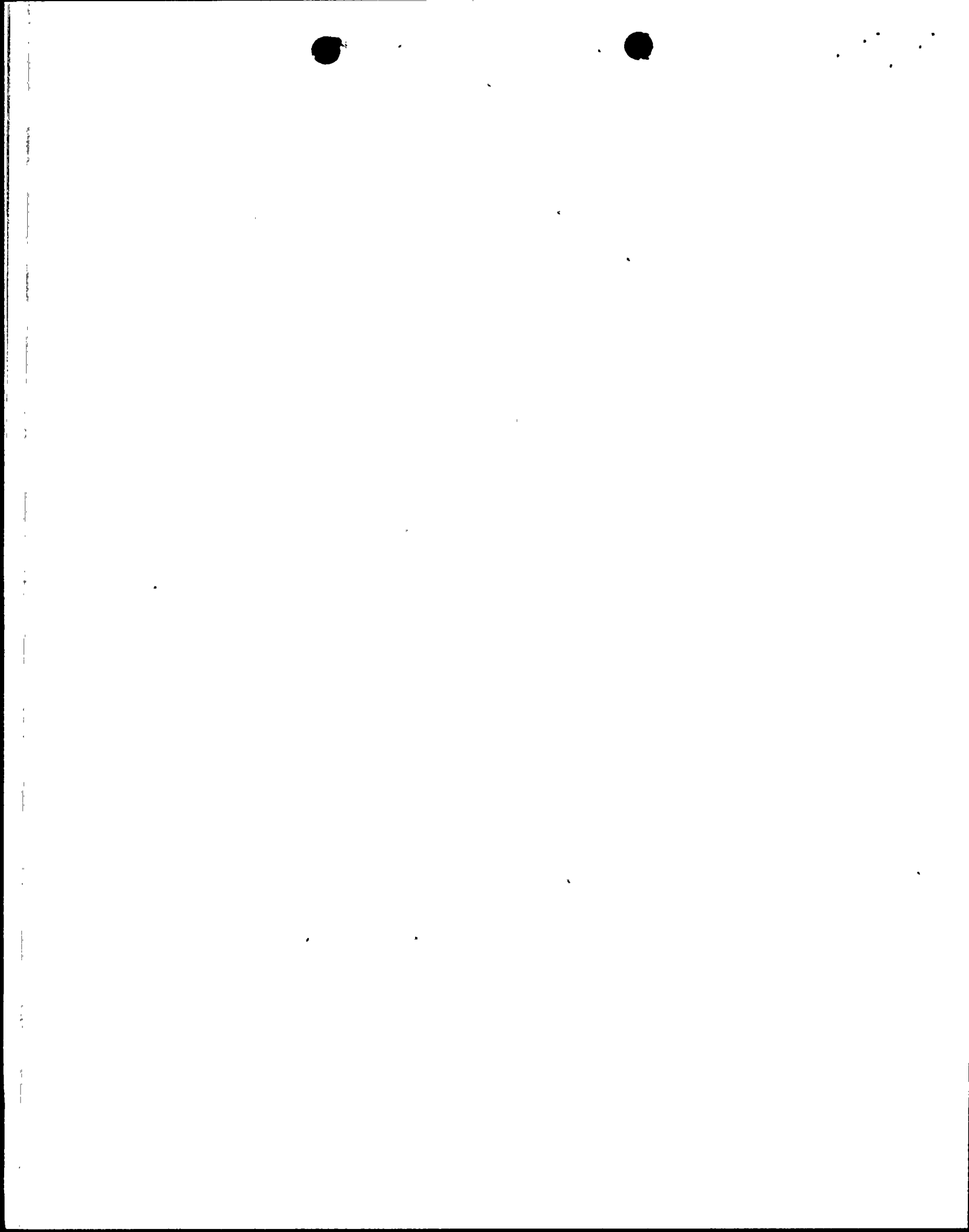
The general subject areas to be evaluated for inclusion in the lecture series are as follows:

- a) Theory and principles of operation
- b) General and specific plant operating characteristics
- c) Plant instrumentation and control system
- d) Plant protection systems
- e) Engineered safety systems
- f) Normal, abnormal and special operating procedures
- g) Radiation control and safety
- h) Technical specifications
- i) Applicable portions of Title 10, Code of Federal Regulations
- j) General safety, first aid and fire fighting
- k) Changes in equipment and operating procedures
- l) Facility design and license changes
- m) Quality assurance for operations
- n) Fuel handling equipment and techniques
- o) Features of facility design including plant systems
- p) Administrative procedures, conditions and limitations
- q) Related nuclear industry operating experience
- r) Emergency plan and procedures
- s) Heat transfer, fluid flow and thermodynamics
- t) Mitigation of accidents involving degraded core
- u) Special lectures to cover events and special training commitments
- v) Operation of the diesel generators

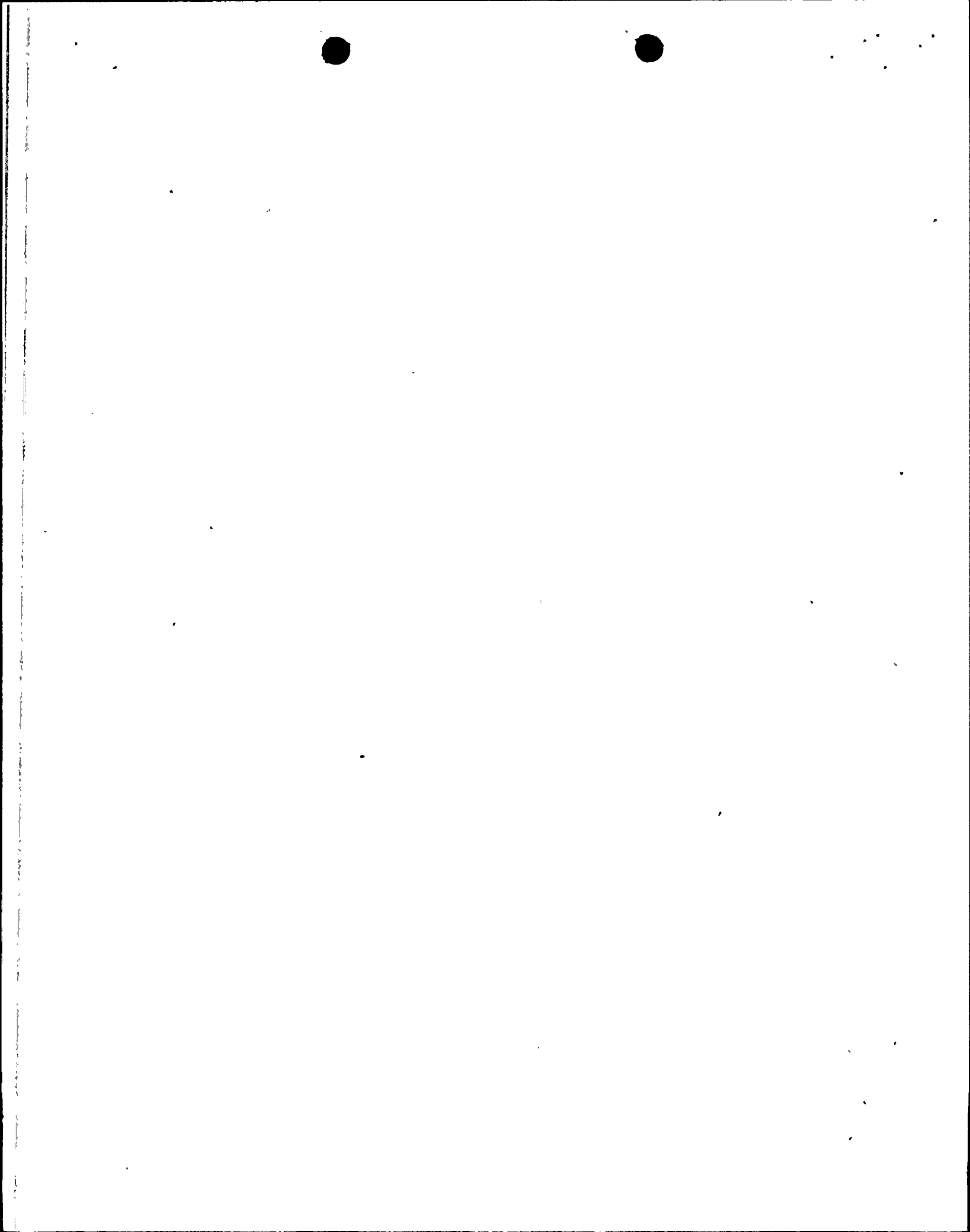
13.2.2.1.2 On-the-Job Training

- a) Reactivity Control Manipulation During Each Two Year Requalification Cycle

Licensed personnel shall participate in manipulations that involve reactivity control. The manipulations shall involve any number of the following:



- *1. Plant or reactor startups to include a range that reactivity feedback from nuclear heat addition is noticeable and heatup rate is established.
2. Plant Shutdown
- *3. Manual control of steam generators and/or feedwater during startup and shutdown.
4. Boration and/or dilution during power operation.
- *5. Any significant (10 percent) power changes due to changes in control rod position.
6. Any reactor power change of 10 percent or greater where load change is performed with load limit control or where flux/temperature control is on manual.
- *7. Loss of coolant including:
 - a. Significant PWR steam generator leaks
 - b. Inside and outside primary containment
 - c. Large and small, including leak-rate determination
 - d. Saturated reactor coolant response (PWR)
8. Loss of instrument air (if simulated plant specific)
9. Loss of electrical power (and/or degraded power sources)
- *10. Loss of core coolant flow/natural circulation
11. Loss of condenser vacuum
12. Loss of service water
13. Loss of shutdown cooling
- *14. Loss of component cooling system or cooling to an individual component
15. Loss of normal feedwater or normal feedwater system failure
- *16. Loss of all feedwater (normal and emergency)
17. Loss of protective system channel
18. Mispositioned control rod or rods (or rod drops)
19. Inability to drive control rods



20. Conditions requiring use of emergency boration
21. Fuel cladding failure or high activity in reactor coolant waste gas processing systems
22. Turbine or generator trip
23. Malfunction of automatic control system(s) which affect reactivity
24. Malfunction of reactor coolant pressure/volume control system
25. Reactor trip
26. Main stream line break (inside or outside containment)
27. Nuclear instrumentation failure(s)

The starred (*) items shall be performed annually, the remaining items must be accomplished during the requalification program two year period. Those items that are not performed during actual plant operation shall be performed during periodic simulator training.

b) Knowledge of Procedures and Changes to the Plant

All license operators will review the content of off-normal, emergency, and security procedures on a regularly scheduled basis. The review will consist of any of the following: self-study, lectures conducted by shift supervisors, or simulated walk through. All off-normal, emergency, and security procedures will be reviewed in each requalification period.

Changes to the plant design, procedures, technical specifications and limiting conditions of operation will be promulgated to licensed operators.

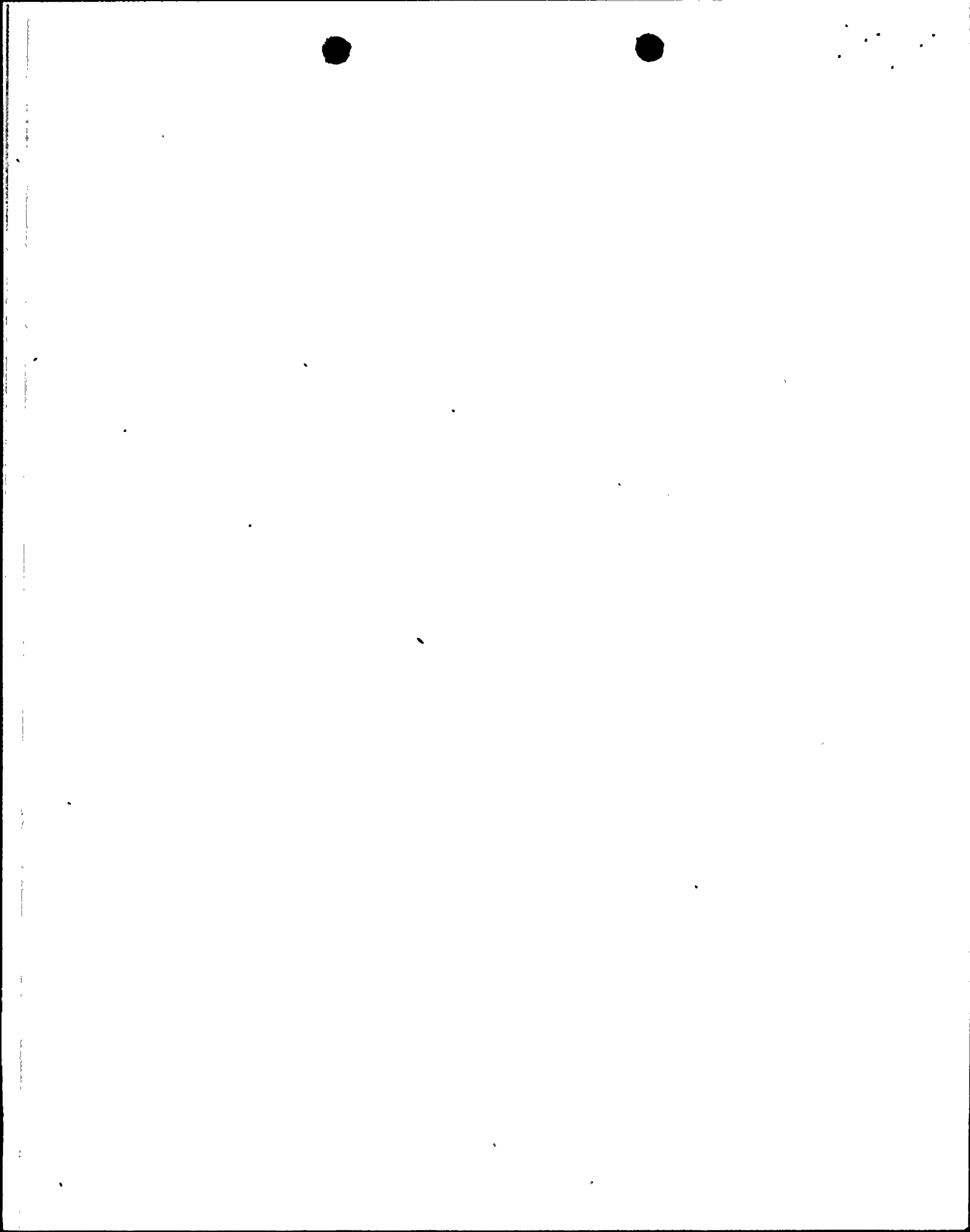
13.2.2.1.3 Evaluation

An annual evaluation will be made to determine both the makeup of the training program, and the continued competencies of individual licensed operators.

a) An annual written examination will be given covering the following areas:

1) Reactor Operator and Senior Reactor Operator

(a) Theory and Principles of Reactor Operation

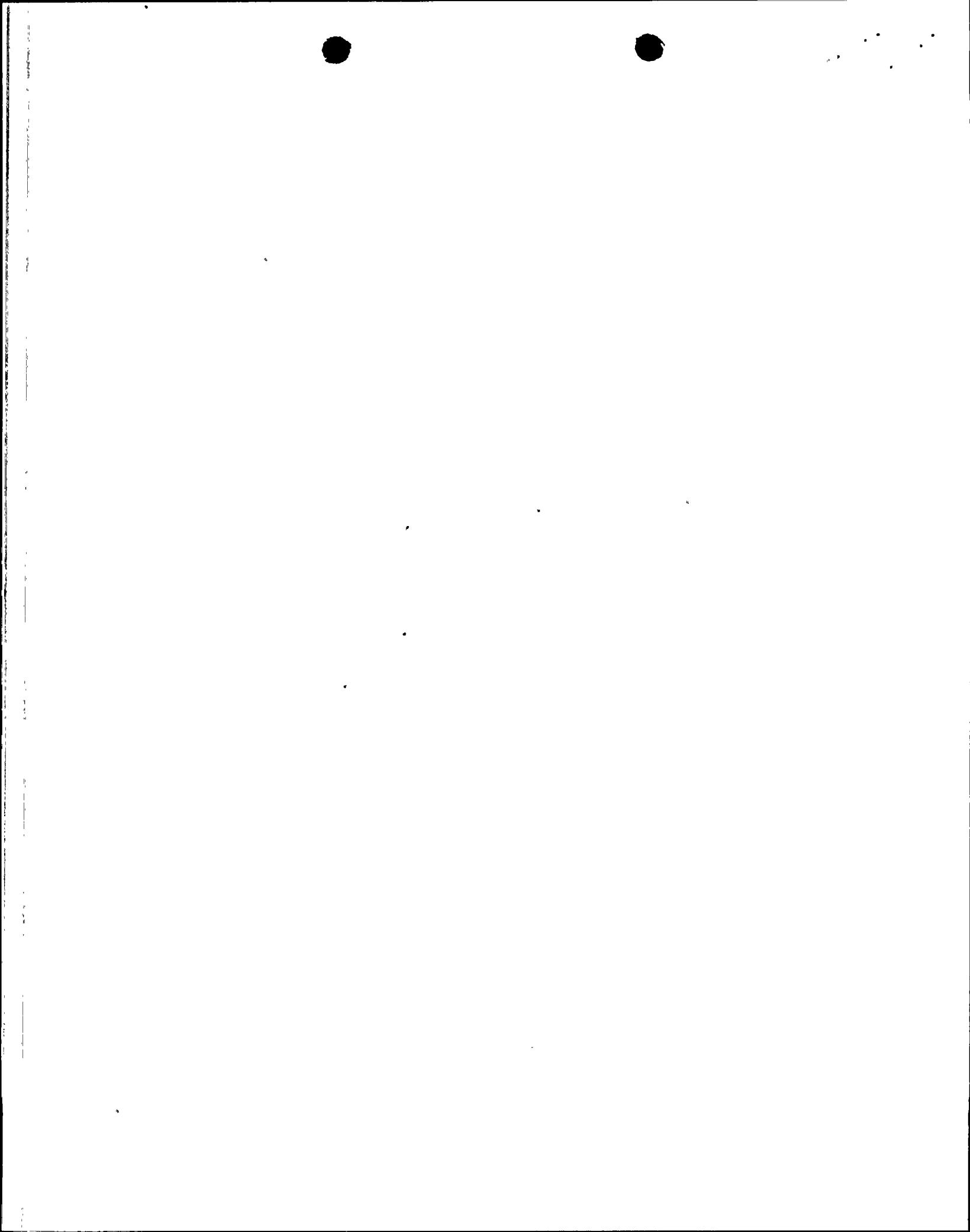


- (b) Features of Facility Design
 - (c) General and specific Operating Characteristics
 - (d) Instruments and Controls
 - (e) Safety and Emergency Systems
 - (f) Standard and Emergency Operating Procedures
 - (g) Radiation Control and Safety
 - (h) Principles of Heat Transfer and Fluid Mechanics
- 2) Senior Reactor Operator
- (a) Reactor Theory
 - (b) Radioactive Materials Handling, Disposal and Hazards
 - (c) Specific Operating Characteristics
 - (d) Fuel Handling and Core Parameters
 - (e) Administrative Procedures, Conditions and Limitations
 - (f) Theory of Fluids and Thermodynamics

A score of at least 70% on any section and an overall score of at least 80% on the annual evaluation examination is considered acceptable. Any licensed operator or senior operator failing to meet this criterion shall be administratively removed from licensed duties and assigned to accelerated training.

The scope and duration of the accelerated training program will be determined by the Training Manager based on the individual's deficiencies. The individual will be assigned licensed duties after completing the accelerated course and passing an examination covering the required sections. A score of at least 80% on each examination section is required before the individual may resume licensed duties.

In the event that this standard is not met, the individual's suitability for resuming licensed duties will be reviewed by the Training Manager. The Training



Manager shall provide a recommendation to the Manager of Nuclear Operations regarding the individual's permanent removal from licensed duties or additional upgrading efforts to be considered. If appropriate, another accelerated re-qualification program shall be structured to correct deficiencies.

Licensed operating personnel may be excused from lectures in areas in which they scored above 90% in the annual evaluation examination.

Licensed supervisory or training personnel will be exempt from taking the annual examination, provided these individuals are directly involved in the preparation and grading of the examination.

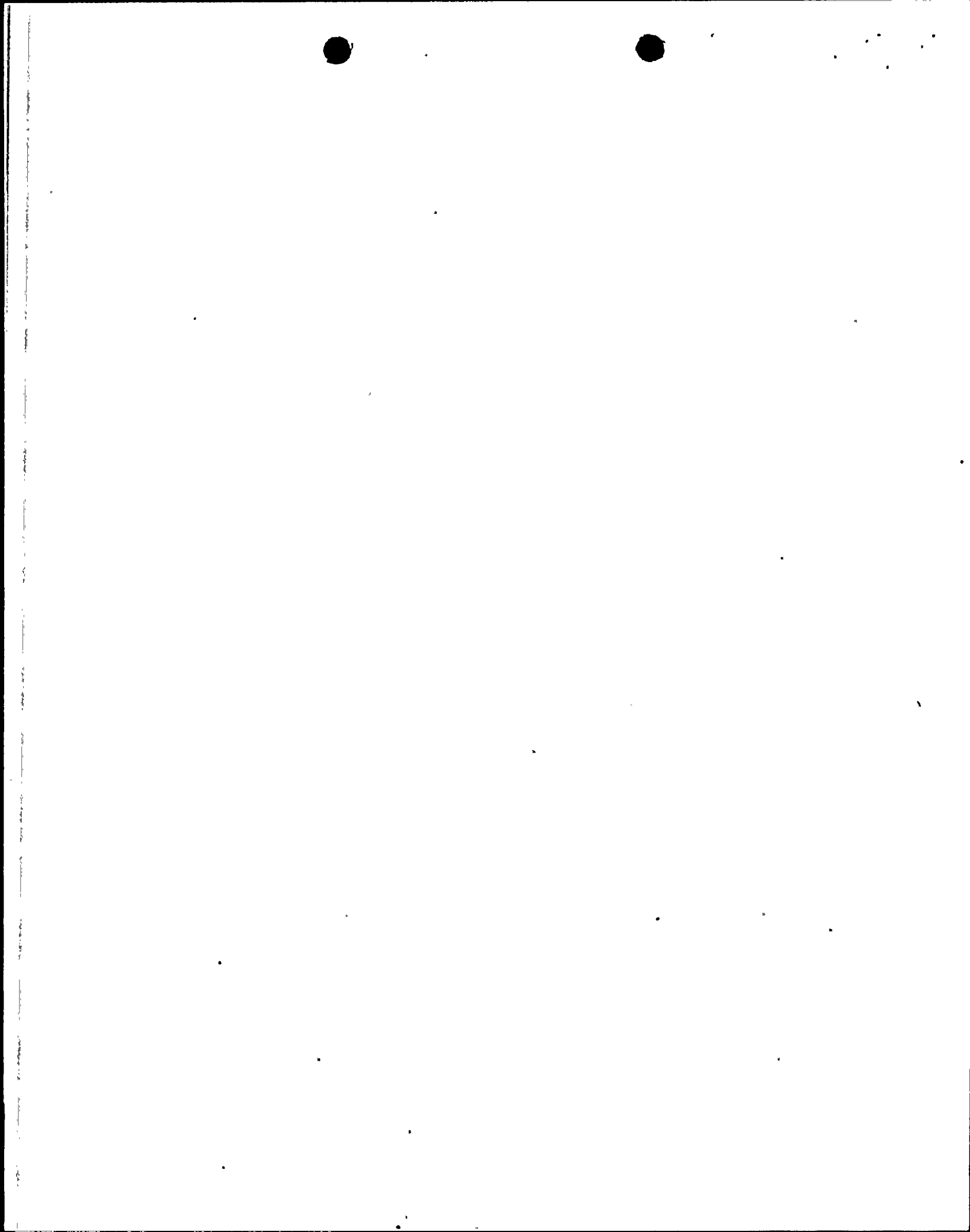
Periodic observation and evaluation of licensed operators while at the controls of the simulator will be made. The evaluation will include actions taken or to be taken during simulated abnormal and emergency conditions.

13.2.2.1.4 Inactive Status Retraining

If a licensed individual has not actively carried out licensed duties for a period in excess of four months, a special retraining program and/or evaluation will be required prior to resuming licensed duties.

The Training Manager shall designate a licensed senior operator to conduct an oral examination similar in scope and format to an annual oral examination prior to resuming licensed duties.

In addition, evaluation of performance in the current lecture series shall be conducted. If performance in the lecture series is unsatisfactory a



written examination similar in scope and format to the annual written examination shall be administered to the licensed individual prior to resuming licensed duties.

The performance standards applied to the annual requalification examination shall be used in evaluating the results of the oral and written examinations. If the performance standards are not met, the licensed individual shall complete an accelerated requalification program prior to resuming licensed duties.

13.2.2.1.5 Requalification Program Documentation

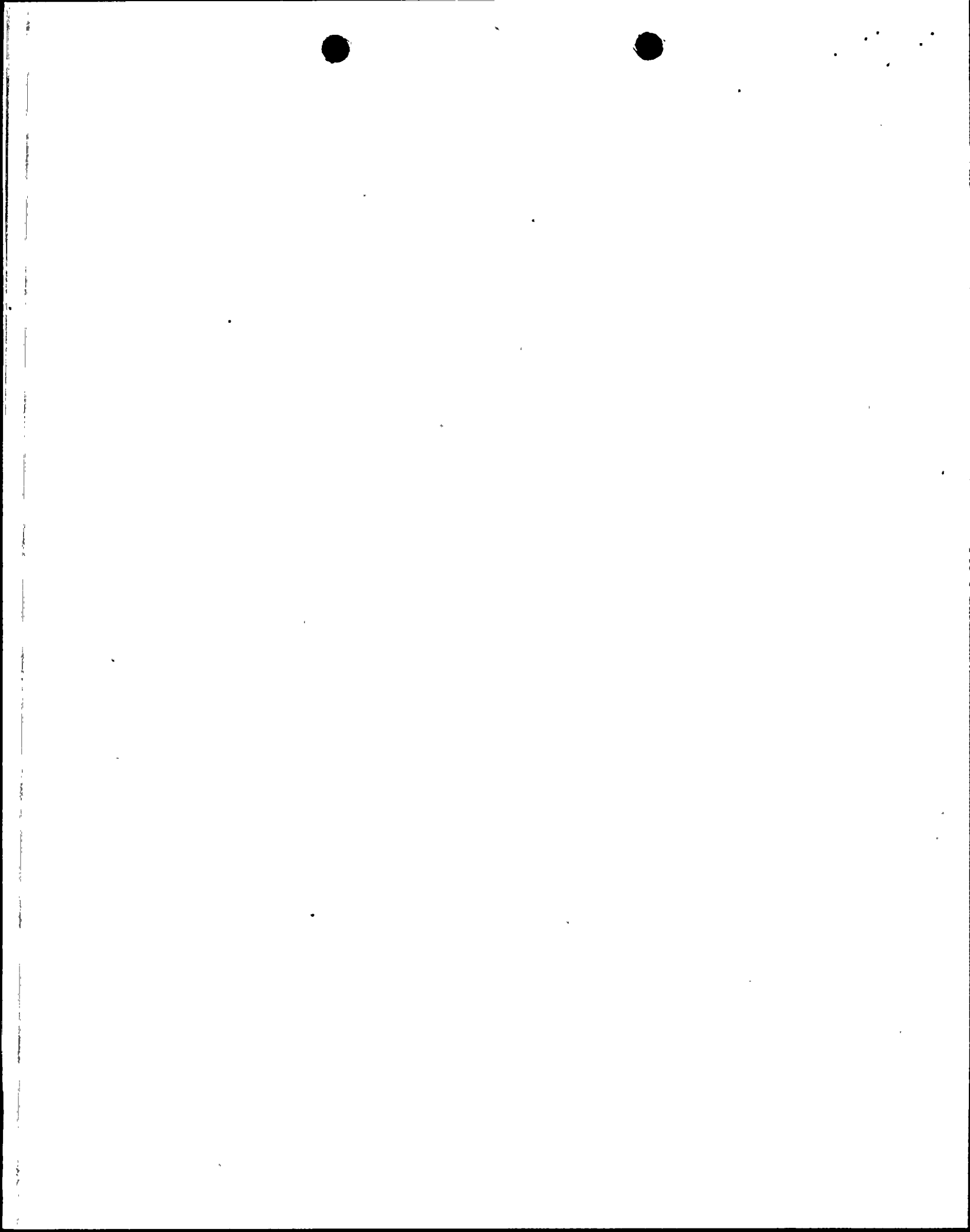
Copies of the following requalification records shall be maintained for two years following the date of recorded event or requalification program completion:

- a) Licensed Operator Requalification Summary
- b) Topic quizzes, answers given by licensee and quiz answer key
- c) On-the-job training records
- d) Change review records
- e) Annual Written Examination, answers given by licensee and answer key
- f) Annual oral examination reports
- g) Accelerated training programs (if assigned)

A permanent record shall be maintained for each operator containing verification of each program completion and the overall grade scores for the two year program. This permanent record file shall be maintained for the life of the facility and conforms with the requirements of 10CFR55 Appendix A.

13.2.2.2 Refresher Training for Nonlicensed Personnel

Station personnel regularly employed at the station will receive refresher



training commensurate with their job duties. This refresher training will consist of the general employee retraining program and specific job-related retraining.

13.2.2.2.1 General Employee Retraining

Non-licensed plant personnel will receive retraining (General Employee Training) on an annual basis. The extent of this retraining will be commensurate with job duties and level of plant access. The retraining will consist of lectures, videotapes and/or discussions of topics detailed in Section 13.2.1.4 (General Employee Training).

13.2.2.2.2 Job-related Retraining

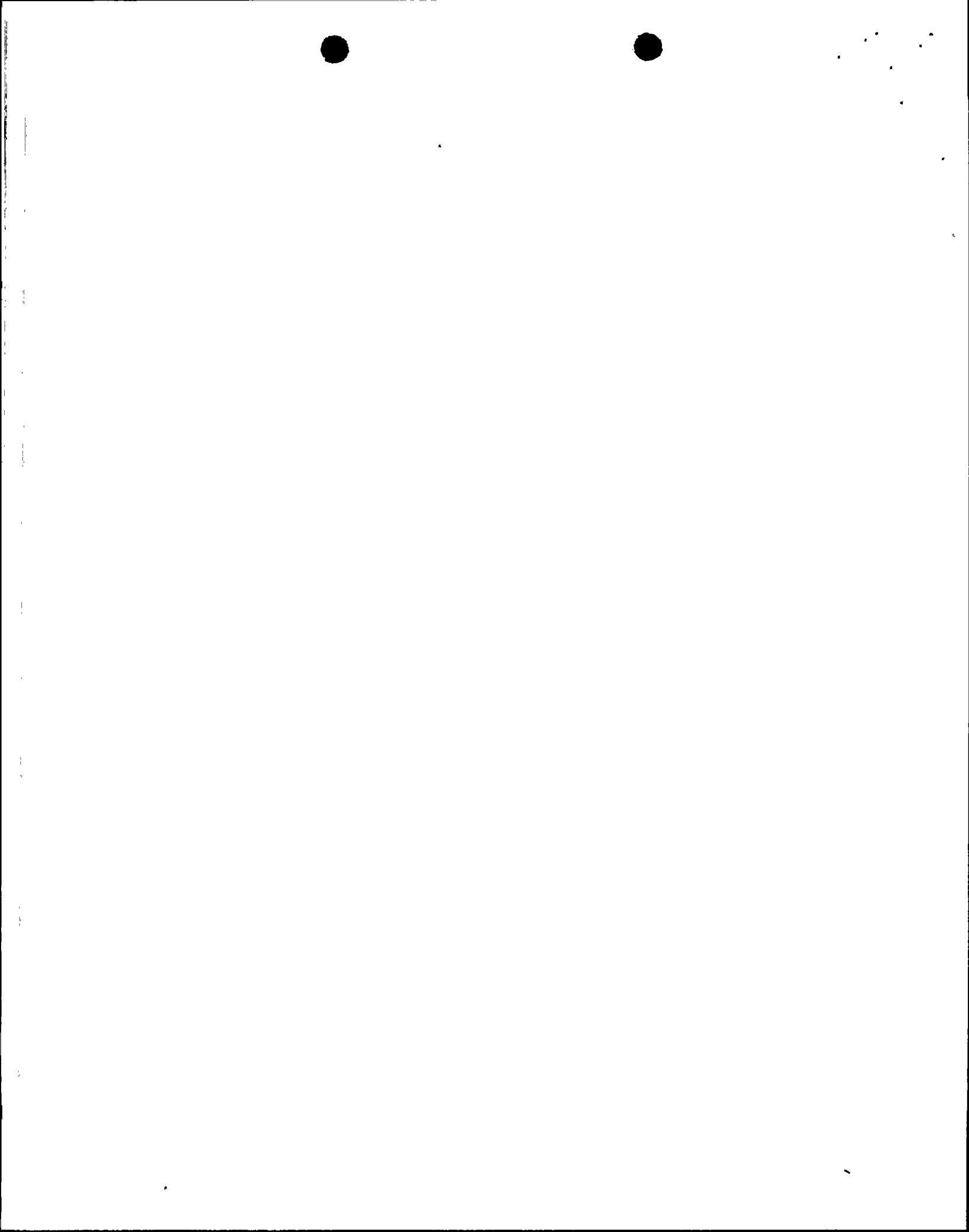
Certain technicians on the plant staff will require periodic retraining in those duties that are complex and/or difficult. On an individual basis, the duties of the technicians will be evaluated and a determination made by the department head as to which duties require retraining. This determination may be based on evaluations such as:

- a) Chemistry and radiological technicians may be required to satisfactorily demonstrate the analyses they are qualified to perform.
- b) Responsible instrument technicians may be required to satisfactorily demonstrate understanding of the operation of the plant protective system.

In no case will this retraining be less frequent than biennial.

13.2.2.3 Replacement Training

Training of individuals to fill vacancies will be conducted to assure a sufficient reserve of qualified individuals, as well as to prepare individuals



for greater responsibility. This training ensures that replacement personnel will have the qualifications specified in section 13.1.

13.2.2.3.1 Licensed Personnel Replacement Training

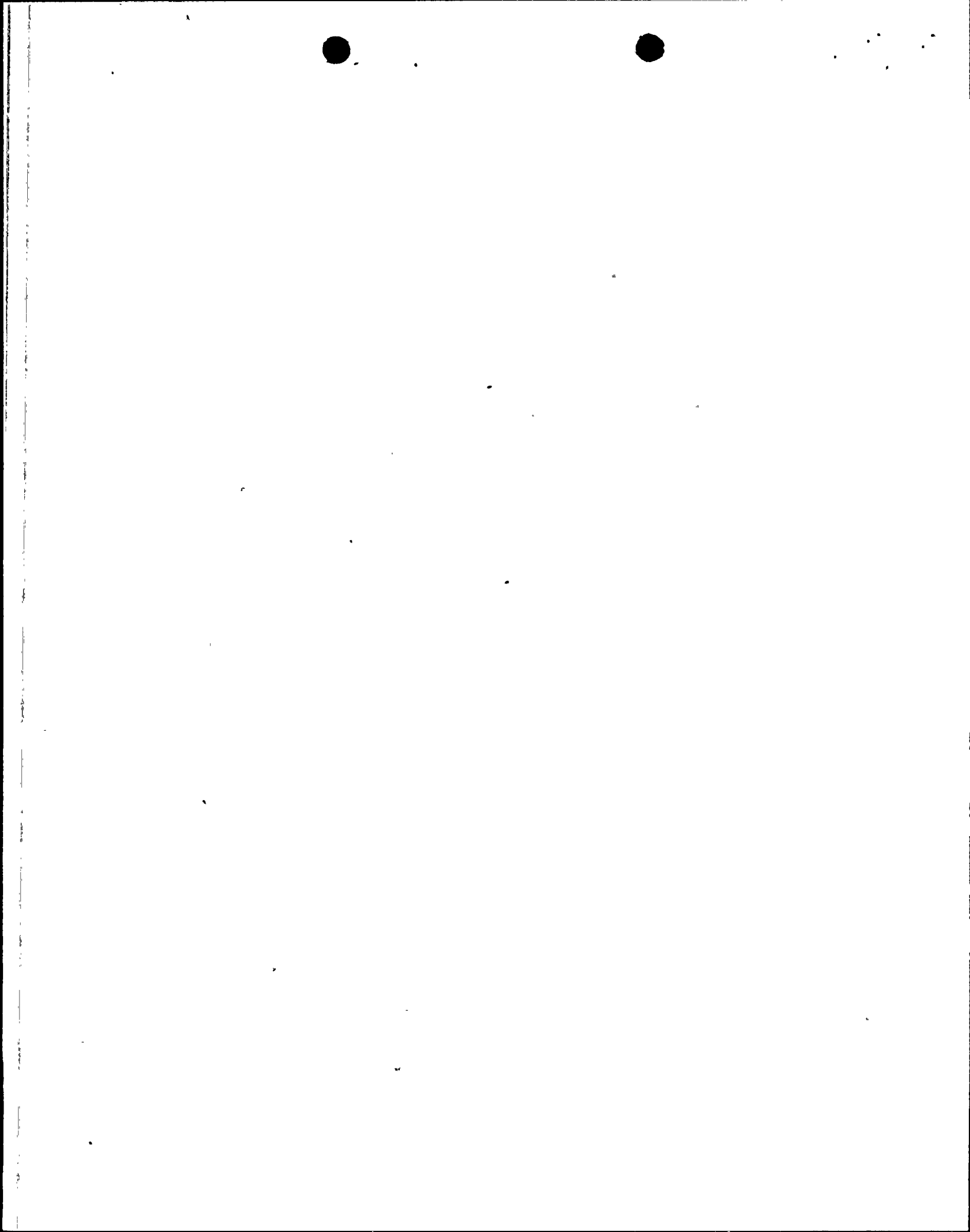
Replacement operators shall have two (2) years of power plant experience. One (1) year of this experience shall be nuclear power plant experience and include six (6) months at PVNGS.

a. Related Technical Training

A technical training program consisting of text material, lectures, videotapes, seminars, reading assignments, etc., organized in such a manner that technical subjects required by an NRC licensed operator is presented. Frequent quizzes and examinations will be given to insure the information is being understood and to document the training progress. Test questions will be of a type that test a student's understanding.

b. On-the-Job

Licensed candidates will be assigned to a program of watchstanding under instruction. The principle part of the program will be to stand control room watches and manipulate the plant controls. Whenever possible, all normal, day-to-day plant operations should be performed by the watchstander under instruction. Whenever special plant evaluations are scheduled, he will be notified so he can participate. During this phase the license candidate's additional studies will be guided by a study guide that directs his effort to important areas and limits the duplication of study.



He will be under the direct supervision of a licensed watchstander. The studyguide will be signed off by the Training Manager and the Operations Superintendent.

c. Simulator Training Program

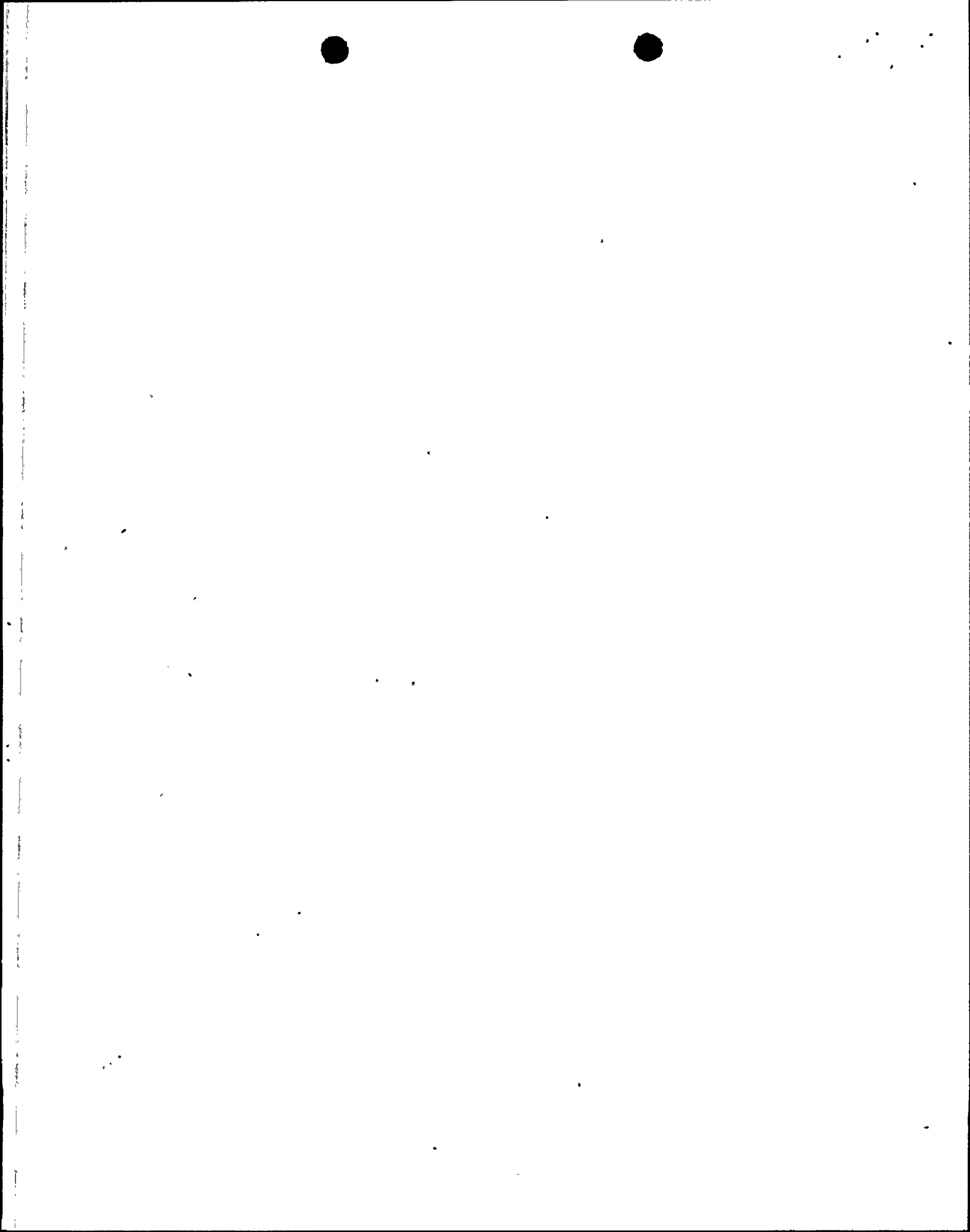
The simulator training program will provide operational hands-on experience. The licensed candidate shall participate in training sessions that include the plant control manipulations required prior to obtaining an NRC license.

At the end of the simulator training program a reactor startup examination will be given to the license candidate where he will be evaluated on his ability to:

- 1) Manipulate the controls and keep the reactor under control during a reactor startup
- 2) Predict instrument response and use the instrumentation during a reactor startup
- 3) Follow station startup procedures
- 4) Explain alarms and annunciators that may occur during this operation.

d. Review and Evaluation

An audit examination and evaluation of the license candidate will conclude the training program.



Extensive operating experience at a reactor facility which is generally classified as comparable in complexity and operating characteristics to PVNGS may substitute for some of the training. The Training Manager will make a determination, on a case-by-case basis, of which previous experience may substitute for training segments and will ensure that sufficient plant specific instruction is provided.

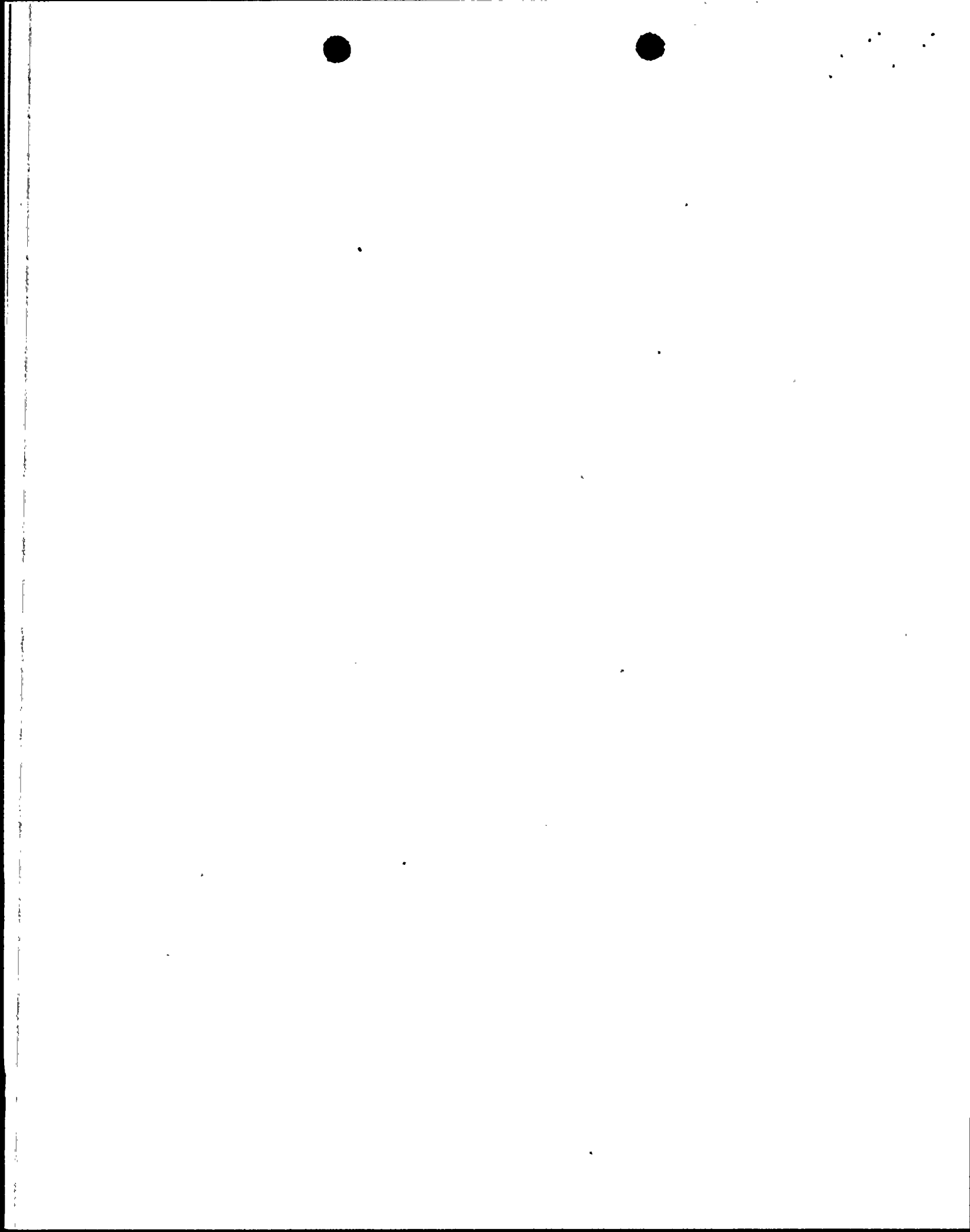
13.2.2.3.2 Senior Licensed Personnel Replacement Training

a. On-the-Job (Three Months)

Senior licensed candidates shall be assigned to a program of watchstanding under instruction. The principle part of the program will be to stand Assistant Shift Supervisor watches under instruction. Whenever possible normal day to day duties should be performed by the watchstander under instruction. During this phase the senior licensed candidate will be guided by a study guide. He shall be under the direct supervision of a senior licensed watchstander. The study guide shall be signed off by the Training Manager and the Operations Superintendent.

b. Senior license candidates will have additional instruction in subjects relating to their duties. This instruction will include:

- 1) Reactor Theory
- 2) Handling and disposal of and hazards associated with, radioactive materials
- 3) Specific operating characteristics



- 4) Fuel handling and core parameters
- 5) Administrative procedures, conditions, and limitations
- 6) Chemistry
- 7) Watchstanding philosophy
- 8) Fundamentals of heat transfer, thermodynamics, fluid flow and dynamics related to transient analysis
- 9) Responsibilities during emergency conditions

13.2.2.3.3 Replacement Training for Non-Licensed Operators

This training shall be similar to that specified in Section 13.2.1.3.1.

13.2.2.3.4 Other Personnel Replacement Training

Replacement training will be determined by the job classification being filled and the individual's previous training and experience.

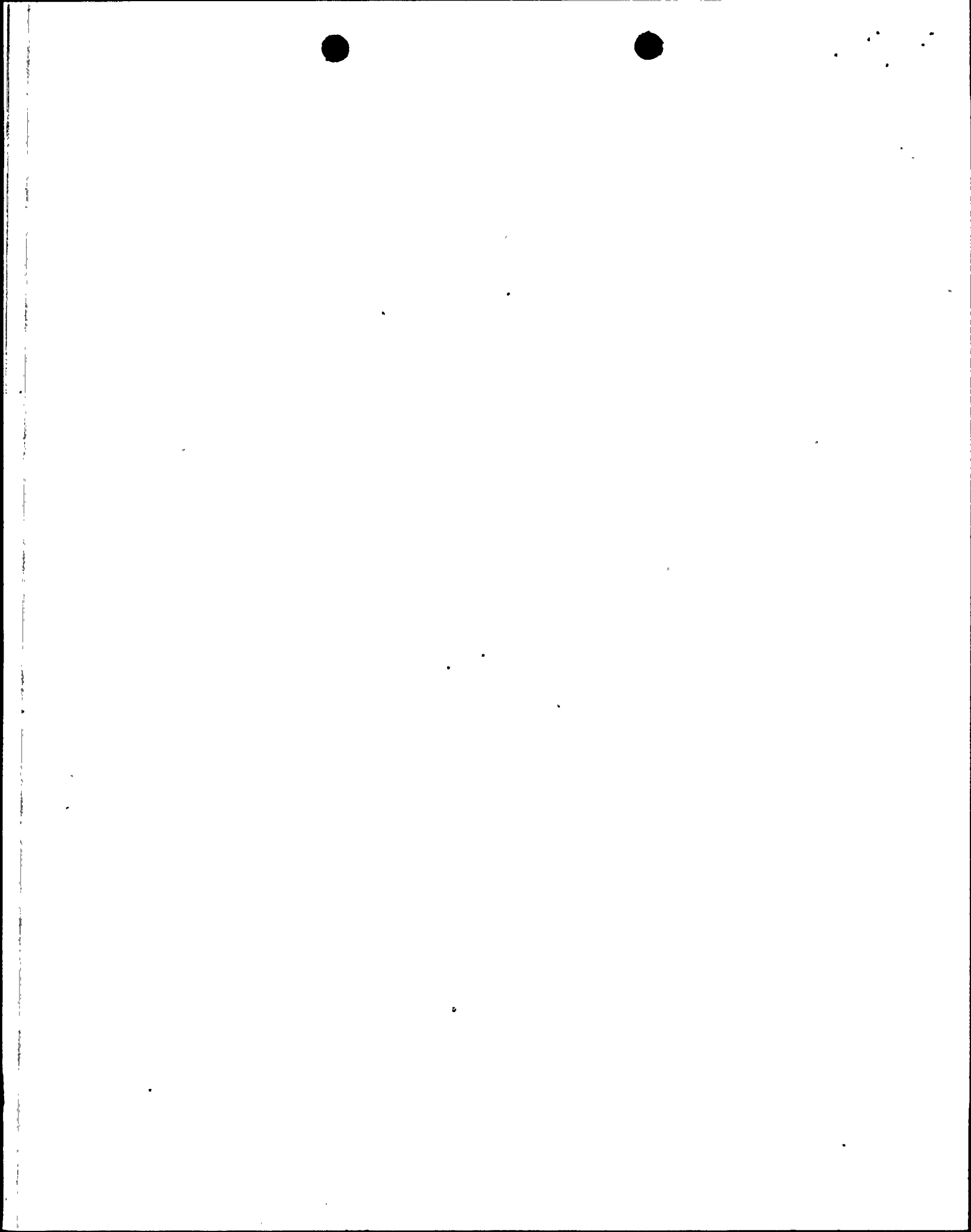
13.2.3 Applicable NRC Documents

The training program is consistent with the requirements of the following regulations:

1. 10CFR Part 50, "Licensing of Production and Utilization Facilities"
2. 10CFR Part 55, "Operators' Licenses"
3. 10CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections"

The guidance of the following documents was used in program development:

1. "Utility Staffing and Training for Nuclear Power", WASH-1130, Revised June 1973



2. NRC Operator Licensing Guide, NUREG-0094, July 1976
3. Regulatory Guides 1.8, 8.2, 8.8, 8.10, and 8.13 with exceptions as noted and revisions as specified in section 1.8.

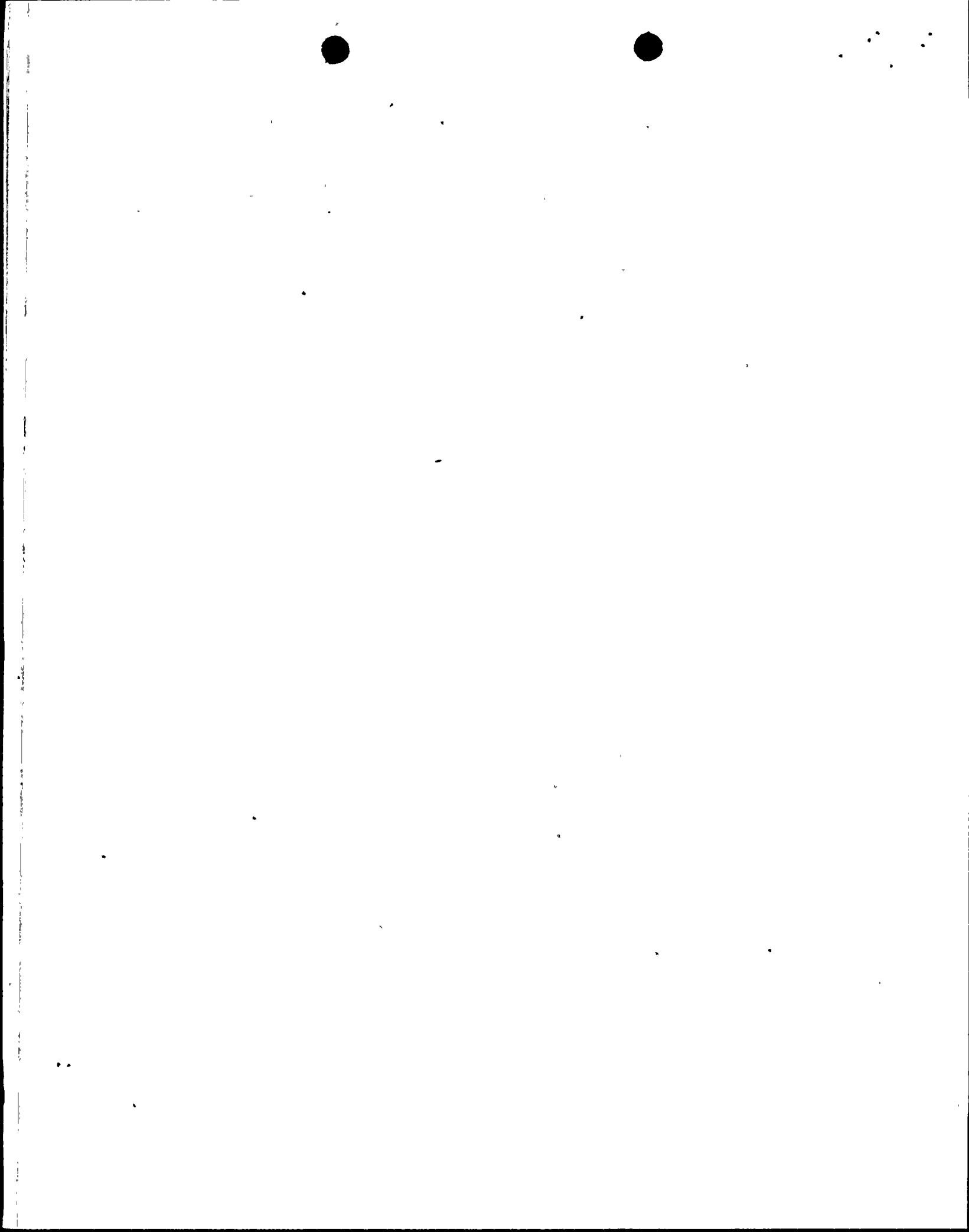


TABLE 13.2-1

COLD LICENSE PROGRAM OUTLINE

Phase I

Nuclear Fundamentals

(Approx. 650 contact hours) 17 weeks

Advanced Engineering Training (SRO)

(Approx. 450 contact hours) 24 weeks

Research or Training Reactor Training

1 week

Observation Training

10 weeks

SRO 52 weeks

RO 28 weeks

Phase II

Nuclear Steam Supply Systems

(Approx. 160 contact hours) 8 weeks

Balance of Plant Systems

(Approx. 180 contact hours) 6 weeks

14 weeks

Phase III

Simulator Training

8 weeks

Mitigating Core Damage

1 week

9 weeks

Phase IV

On-the-Job Training

26 weeks

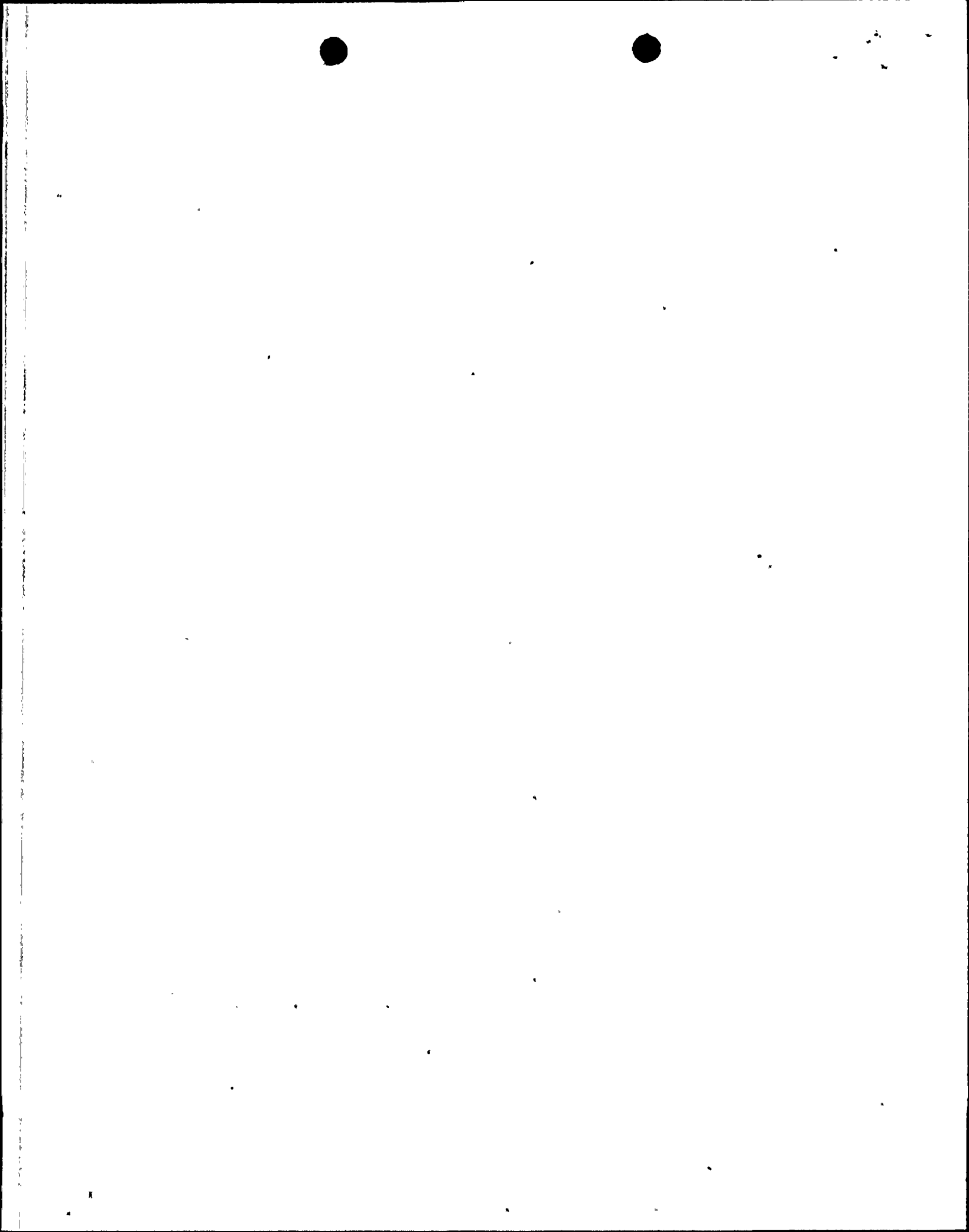
Phase V

Review and Evaluation

5 weeks

TOTAL SRO 106 weeks

RO 82 weeks



STAFF POSITION	LICENSED OPERATOR	NON-LICENSED OPERATOR	PROFESSIONAL TECHNICAL	NON-LICENSED SUPERVISOR	MAINTENANCE	GENERAL EMPLOYEE
PLANT MANAGER			X			X
ASS'T PLANT MANAGER			X			X
ENGR AND TECH SERVICES SUPERINTENDENT			X			X
NUCLEAR SUPERVISOR			X			X
RADIOLOGICAL AND CHEMISTRY SUPERVISOR			X			X
SUPPORT SERVICES MANAGER						X
MAINTENANCE SUPERINTENDENT			X			X
OPERATIONS SUPERINTENDENT			X			X
QUALITY SUPERVISOR			X			X
TRAINING DIRECTOR			X			X
MECHANICAL SUPERVISOR				X		X
ELECTRICAL SUPERVISOR				X		X
CHEMISTRY SUPERVISOR				X		X
RADIATION PROTECTION SUPERVISOR				X		X
I & C SUPERVISOR				X		X
OPERATING SUPERVISOR	X					X
SHIFT SUPERVISOR	X					X
SHIFT FOREMAN	X					X
CONTROL OPERATOR	X					X
AUXILIARY OPERATOR		X				X
MAINTENANCE					X	X

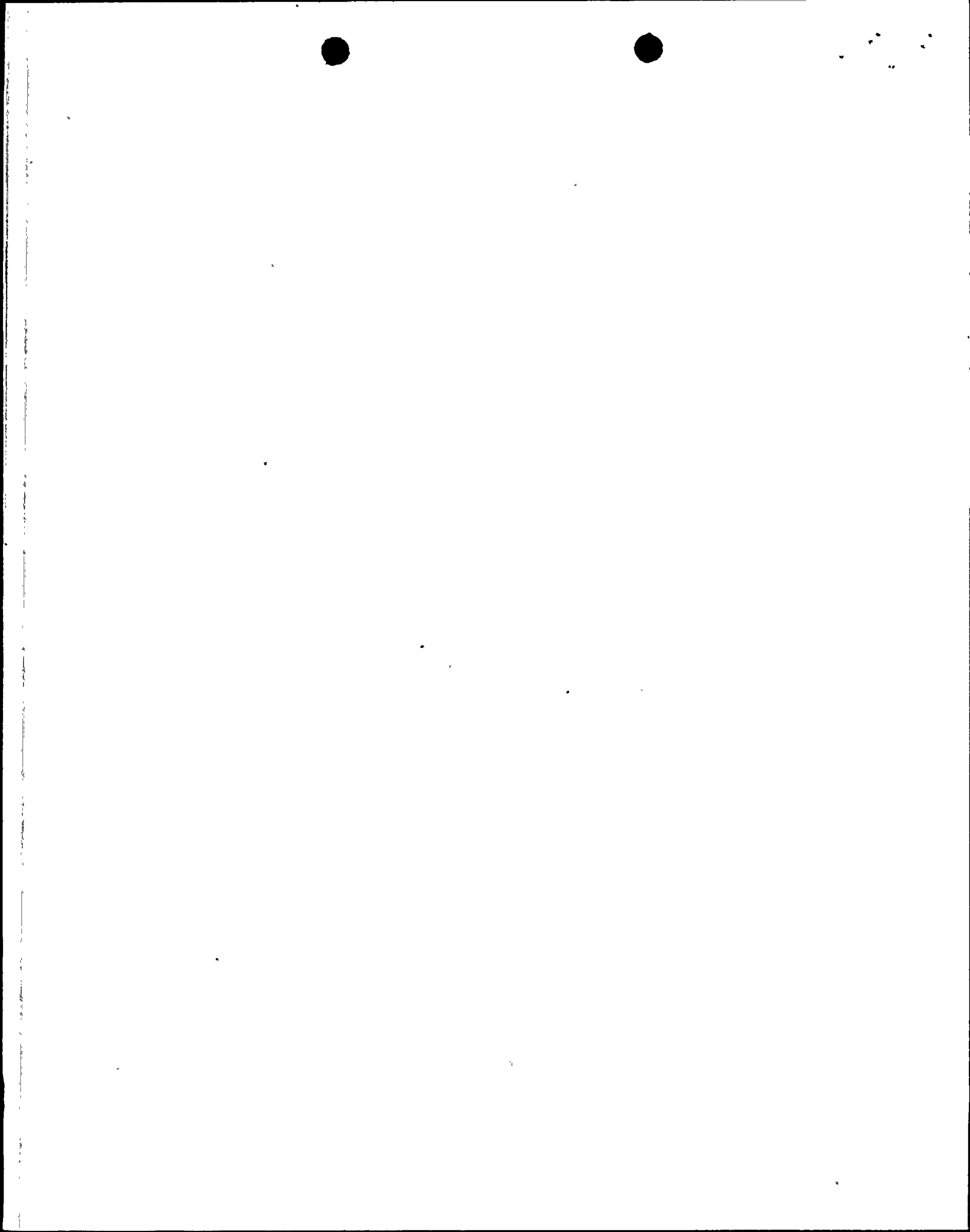
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Palo Verde Nuclear Generating Station
FSAR

PROGRAM DESCRIPTION

Figure 13.2-2



- (2) Increase Passing Grade (NRC letter, H. R. Denton to All Power Reactor Applicants and Licensees, dated March 28, 1980)

The passing grade for the written examination shall be 80% overall and 70% in each category.

- (3) Simulator Exams (NUREG 0737)

Simulator examinations will be included as part of the licensing examinations.

PVNGS Evaluation

- 1. Increase Scope

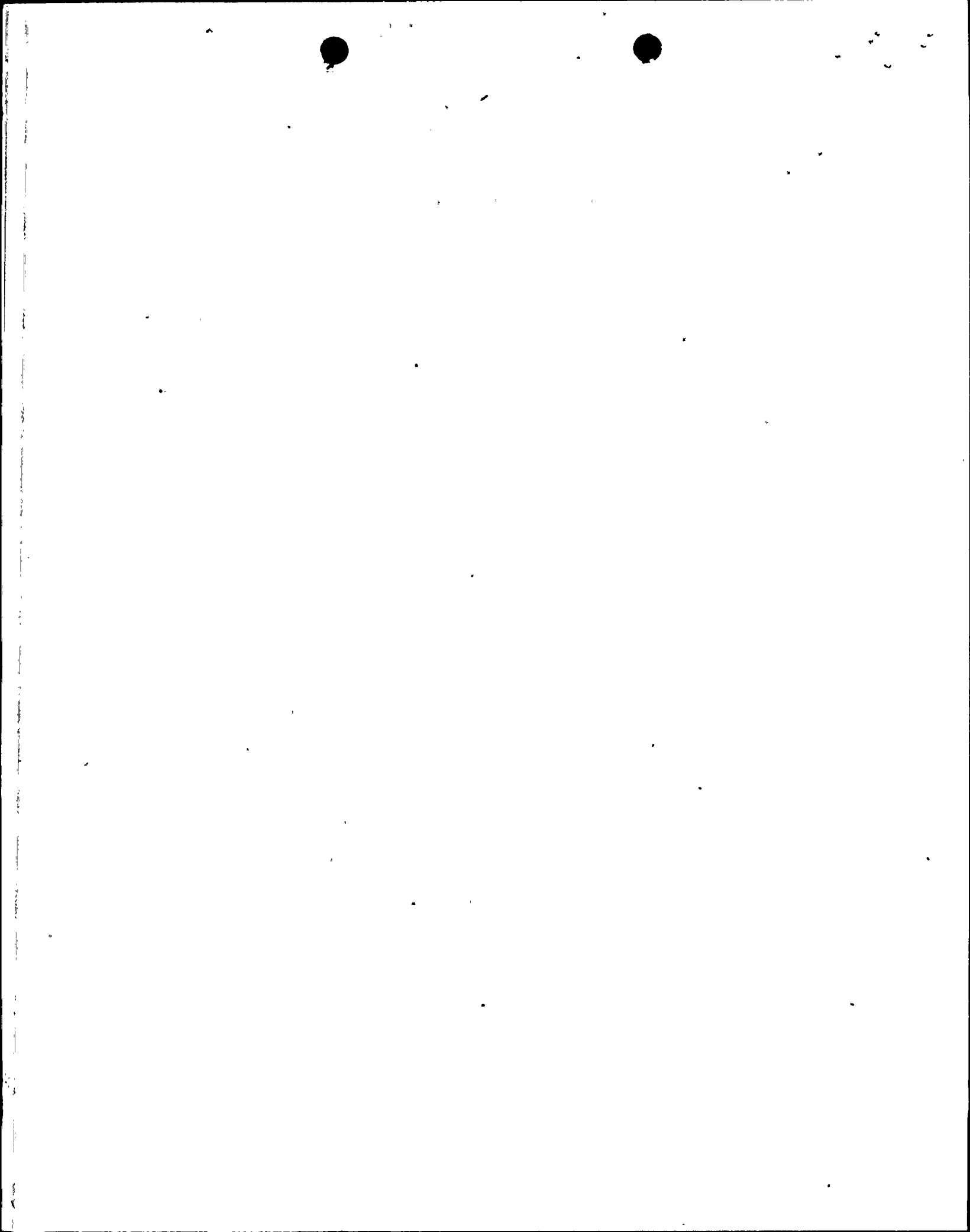
Refer to the response in item I.A.2.1. PVNGS shall request that each applicant for an operator license grant permission to the NRC to inform PVNGS management regarding the result of their examination.

- 2. Increase Passing Grade

All license candidates which are recommended for license examinations are expected to have the ability to complete the examination with a satisfactory score in each category. Candidates will be evaluated on a basis of a passing grade of 80% overall and 70% in each category.

- 3. Simulator Exams

The PVNGS ^{Plant-Specific} simulator will be made available to NRC examiners for examining candidates for reactor operator and senior reactor operator licenses prior to fuel load, including cold examinations.



chain to the licensed operators in the use of installed plant systems to control or mitigate an accident in which the core is severely damaged. The training program will include the topics suggested in the H.R. Denton letter of March 28, 1980.*

Managers and technicians in the Instrumentation and Control (I & C), radiation protection and chemistry sections will receive training commensurate with their responsibilities that meets the requirements of the H.R. Denton letter of March 28, 1980.

(2) Complete Training

The above training will be completed prior to full power operation.

This training will consist of approximately 40 hours of formal classroom presentations by either a private consultant or the engineering staff. Operators will acquire the theoretical basis for these actions in the academic programs and the practical application during the simulator training course. The total training time will exceed 80 hours.

