50-172

Regulatory File Cy.

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Enclosure to LGD/299741

PROPOSED TECHNICAL SPECIFICATION
FOR
RADIATION EFFECTS REACTOR

8/14/70

A-27a

1. SYSTEM CONFIGURATION

1.1 REACTOR COOLING SYSTEMS

The reactor cooling system valves shall be set in a configuration which will prevent flow through the primary and secondary loops. A log shall be kept of the valve configurations and changes. No changes in the valve configurations shall be permitted except as directed by the Reactor Supervisor. During cold weather, exposed piping shall be either drained or heated as necessary to prevent the piping from bursting.

1.2 ELECTRICAL SYSTEMS

The only electrical systems which shall be kept energized routinely will be necessary lighting, the pool circulating system, and circuitry associated with certain monitoring systems. A procedure subject to approval of the Procedure Review Committee will designate specific systems which shall be kept locked in a denergized configuration.

1.3 MECHANICAL SYSTEMS

No routine maintenance will be performed on non-operating equipment. The roll doors on the RER building shall be immobilized both mechanically and electrically. All other doors into areas of the Radiation Effects Facility where radioactive materials or radiation areas are present shall be kept locked except when authorized personnel are in the area.

2. RADIATION MONITORING

2.1 ENVIRONMENTAL SAMPLING

A minimum of two water samplers shall be located in the Etowah River, at least one being located 3600 or more feet upstream from the reactor and at least one 3600 or more feet downstream from the reactor. Samples shall be collected at least twice monthly; the collection interval shall be approximately two weeks except when weather conditions make the sample collecting points inaccessible. Samples shall be analyzed for gross beta-gamma-alpha activity.

Soil and vegetation samples shall be collected on a quarterly basis and analyzed for gross beta-gamma-alpha activity.

2.2 RER STORAGE POOL

Grab samples of the RER storage pool water shall be collected weekly and analyzed for gross beta-gamma-alpha activity.

3. FUEL STORAGE

3.1 SPENT ELEMENT STORAGE

Except as provided in Paragraph 3.4, partially spent fuel elements shall be stored in fuel element storage racks in the bottom of the storage pool. Control rods shall be stored either in control rod storage racks along the pool wall or in control rod storage positions, two of which may be available in each fuel element storage rack. Cold clean fuel elements may also be stored in fuel element storage racks with partially spent fuel elements.

3.2 FUEL ELEMENT STORAGE RACKS

Fuel element storage racks are constructed of aluminum, and contain layers of aluminum-clad cadmium around the outside of the fuel plate region and between each tier of four fuel elements. Each rack shall hold a maximum of 20 fuel elements in a 4 x 5 array. The 4 x 5 array has accomodations for storing two control rods in fuel element position.

3.3 COLD CLEAN FUEL ELEMENT STORAGE

Pending shipment off-site, cold clean fuel elements which are not stored in fuel element storage racks in the reactor storage pool shall be stored in their original criticality-safe shipping containers in an area which is equipped with a criticality alarm in accordance with 10 CFR 70 and protected in accordance with 10 CFR 73. Shipment off-site shall be made in accordance with appropriate AEC & DOT regulations.

3.4 PREPARATION FOR SHIPMENT

When fuel is being prepared for shipment off-site, fuel element end boxes and control rod lifting bails may be removed from the fuel assemblies before the fuel is loaded into the cask. Such removal shall be accompanied only in accordance with

detailed procedures approval by the Procedure Review Committee. Casks used for removal and shipment of fuel shall have been duly licensed for such usage in accordance with appropriate AEC & DOT regulations. Procedural control shall be used to assure that no more than one fuel assembly at a time is out of a storage rack or a shipping cask. Individual fuel assemblies shall be handled only under the direct personal surveillance of the Reactor Supervisor.

3.5 RER STORAGE POOL

While the reactor fuel is stored in the RER storage pool, the pool circulating pump shall be kept operating except when necessary maintenance is being performed on the pump. The pump shall be checked weekly for proper operation. The pool demineralizer or bypass demineralizer shall be used in the pool circulating loop to maintain the desired level of water purity. A pool level alarm shall be in operation, and shall sound an alarm in Plant Security Headquarters if the water level drops below 18 feet. The pool level alarm shall be checked for operability weekly, and may be out of operation for brief periods for maintenance and repair. Pool conductivity and pH shall be checked weekly. A reserve supply of demineralized water shall be stored in the 100,000 gallon storage tank.

3.6 CRITICALITY ALARM

While reactor fuel is stored in the RER storage pool, a criticality alarm shall be in operation to comply with 10 CFR 70. The criticality alarm shall be checked for operability weekly, and may be out of operation briefly for maintenance and repair.

4. ADMINISTRATIVE AND PROCEDURAL SAFEGUARDS

4.1 ADMINISTRATIVE ORGANIZATION AND STAFFING

4.1.1 Organization

The Reactor Supervisor, appointed by the Lockheed-Georgia Company Chief Scientist - Director of Research - shall be responsible for all activities within the RER exclusion fence. A Health Physicist reporting to the Chief Scientist - Director of Research - shall be an advisor to the Reactor Supervisor.

4.1.2 Procedure Review Committee

A Procedure Review Committee, appointed by the Chief Scientist - Director of Research - shall monitor activities within the RER exclusion fence. As a minimum, the Procedure Review Committee shall consist of the Reactor Supervisor, the Health Physicist, and two additional scientists/engineers, one of whom shall be chairman. Addendum 1 lists the names and qualifications of the incumbents. When any changes are made in the Procedure Review Committee membership, Lockheed shall advise the Commission within 30 days of the nature of the changes and the names and qualifications of new members. All procedures pertaining to activities within the RER exclusion fence shall be subject to the approval of the Procedure Review Committee. Actions of the Committee shall require unanimous concurrence. The Committee shall meet at least monthly during the period of this license.

4.2 PROCEDURAL SAFEGUARDS

4.2.1 Access

Plant Security shall control keys to the RER exclusion fence, and shall issue the keys in accordance with procedures approved by the Procedure Review Committee. Access to the reactor building shall be under the control of the Reactor Supervisor. Guidelines

for such access shall be subject to the approval of the Procedure Review Committee. Plant Security shall patrol the RER exclusion fence at least weekly, and the Radiation Effects Facility at least daily.

4.2.2 Emergency Procedures

Detailed emergency plans and procedures, covering all classes of potential GNL incidents, shall be prepared and published in the GNL Emergency Manual. The Emergency Manual shall be reviewed and approved by the Procedure Review Committee.

4.2.3 Fuel Element Manipulation

All fuel handling operations shall be conducted in accordance with written procedures under the direct personal supervision of the Reactor Supervisor.

4.2.4 Health Physics Surveillance

Health Physics surveillance shall be provided whenever significant quantities of radioactive materials are to be handled. The Health Physicist shall determine when such surveillance is necessary.

Addendum 1 - 8/14/70

The members of the Procedure Review Committee as of this date are:

F. L. Amend, Reactor Supervisor

M. M. Ham, Health Physicist

M. A. Dewar, Scientist, Chairman

W. E. Krull, Scientist

Summaries of their education and experience are attached.

F. L. AMEND

1961 - Present LOCKHEED-GEORGIA COMPANY

Group Engineer - Reactor Operations & Nuclear Safety

Supervisor, Reactor Operations Group. In charge of Radiation Effects Facility. Responsible for all operations at the Radiation Effects Reactor (RER); for reactor safety during RER operations; for engineering maintenance of the RER and associated systems; for reactor operator training and coordination of operator licensing; for facility licensing activities; and for coordination and administrative control of all other activities at the Radiation Effects Facility. Member and secretary, Reactor Safety Committee, and member, LGNI Isotopes Committee. Licensed senior reactor operator.

1958 - 1961 LOCKHEED-GEORGIA COMPANY

Nuclear Engineer, Senior - Reactor Operations Department

Shift Supervisor, responsible to the RER Group Engineer for reactor operation, safety, calibration, maintenance, and completion of assigned daily operations. Assisted in acceptance tests of RER systems and components and in initial startup and calibration of the RER.

1953 - 1958 E. I. DUPONT COMPANY, SAVANNAH RIVER PLANT

Reactor Shift Supervisor

Served as Shift Supervisor for operation of the production reactors at the Savannah River Project. One year's experience in technical support of the control rod fabrication facility and one year's experience in job planning and coordinating during periods of reactor shutdown for refueling.

Education: B.S., Petroleum Refining Engineering, Colorado School of Mines

M. M. HAM, III

1964 - Present LOCKHEED-GEORGIA COMPANY

Radiological Safety Engineer, Senior; Health Physics Group

Radiological Safety Officer for Lockheed-Georgia Nuclear Laboratory (LGNL). In charge of Health Physics Group. Responsible for planning and carrying out LGNL health physics program in support of licensed activities. Licensed activities at LGNL include operation of Radiation Effects Reactor; programs involving multicurie quantities of any byproduct material in any form; handling and encapsulation of megacurie quantities of Cobalt-60 and Cesium-137; operation of a quarter-million-curie gamma irradiator; and surveillance over special nuclear material. Health Physics program includes monitoring use of above quantities of activities; personnel dosimetry; routine radiation monitoring and surveys of programs involving reactor, hot cell complex, and radioisotopes laboratories; conduct of area and environmental monitoring, sampling and analysis; coordination of licensing activities and cooperation with regulatory agencies. Chairman, LGNL Isotopes Committee, and member, Reactor Safety Committee. Formerly licensed reactor operator.

1959 - 1964 LOCKHEED-GEORGIA COMPANY

Radiological Safety Engineer and Radiological Safety Engineer, Senior, - Health Physics Group.

Assisted in conduct of LGNL health physics program. Responsible for conduct of health physics program for Radiation Effects Reactor.

1955 - 1959 E. I. DUPONT COMPANY
SAVANNAH RIVER PLANT

Health Physicist

Provided radiological surveillance in reactor operations areas involving general production reactors.

Education: B.S., Business Administration, North Georgia College

Member, Health Physics Society

M. A. DEWAR

1965 - Present LOCKHEED-GEORGIA COMPANY

Scientist, Systems Sciences Laboratory

Primary assignments have been in non-nuclear areas. Secondary assignments have included evaluation of fission product buildup for various reactor operating modes; argon generation at Radiation Effects Reactor (RER); consultant to LGNL Reactor Safety Committee; member and secretary of Lockheed-Georgia Company Isotopes Committee; until Lockheed-Georgia Company Radiological Safety Committee was discontinued, was member and secretary of Radiological Safety Committee; licensing specialist for byproduct materials licensing for LGNL and Lockheed-Georgia Company; presently responsible for planning decommissioning of RER.

1956 - 1965 LOCKHEED-GEORGIA COMPANY

Nuclear Engineer, Senior; nuclear group engineer; associate scientist; nuclear engineer specialist — all in several nuclear organizations.

Wide range of nuclear assignments, including liaison with nuclear reactor manufacturer; supervisor of Critical Experiment Reactor and responsible for all activities in critical facility; acting manager of Reactor Operations Department responsible for all aspects — technical and administrative — of operation of two reactors; member of Reactor Safety Committee; nuclear safety assignments in conjunction with Lockheed experiments for NASA Plum Brook Reactor; shielding studies; acting manager of Reactor Operations and Nuclear Safety Department, responsible for both operation of reactor and conduct of health physics program at LGNL.

1954 - 1956 CONVAIR, FT. WORTH, TEXAS

Nuclear Engineer, Reactor Operations

Operated reactors; performed nuclear safety studies; conducted reactor physics experiments.

Education: M.S., Nuclear Engineering, North Carolina State

W. E. KRULL

1967 - Present LOCKHEED-GEORGIA COMPANY

Scientist, Materials Sciences Laboratory

Conduct of X-ray diffraction studies on metals; utilized both single crystal and powder X-ray diffraction techniques and X-ray spectroscopy. Member Lockheed-Georgia Company Isotopes Committee.

1961 - 1966 ENGINEERING EXPERIMENT STATION, GEORGIA INSTITUTE OF TECHNOLOGY

Employed full time or part time, primarily in Crystal Physics Branch. Utilized a variety of X-ray diffraction techniques in research on such problems as determination of characteristic temperatures, expansion coefficients, and temperature dependence of diffraction.

1962 - 1964 LOCKHEED-GEORGIA COMPANY

Part-time employee. Investigated nuclear safety aspects of planned nuclear rocket flight test program; calculated reactivity and radiation hazards, as well as fission product inventory.

1959, 1960, 1961 (Summers only) LOCKHEED-GEORGIA COMPANY

A variety of assignments in the nuclear organizations including such things as calculation of shielding from nuclear weapons afforded by armored vehicles; planning of nuclear reactor core experiments capable of being performed by pulsed neutron techniques; design of various components and equipments for power and experimental reactors.

1953 - 1958 E. I. DUPONT CO., SAVANNAH RIVER PLANT

Planning, conduct and evaluation of reactor physics experiments utilizing test reactor; for 2-1/2 years responsible for general technical aspects of operation of test reactor. Responsible for several technical aspects of one production reactor, including startup control rod configuration, flux shaping, xenon build-up, burn-out and override, etc.

1962 - Present

A number of full time and part time teaching assignments, teaching physics at Georgia State University, Georgia Institute of Technology, and United States Naval Academy.

Education: Ph.D. Candidate, Physics, Georgia Institute of Technology
M.S., Physics, Georgia Institute of Technology
B.S., Physics, South Dakota State University
A.A., Chemical Engineering, Worthington Junior College