

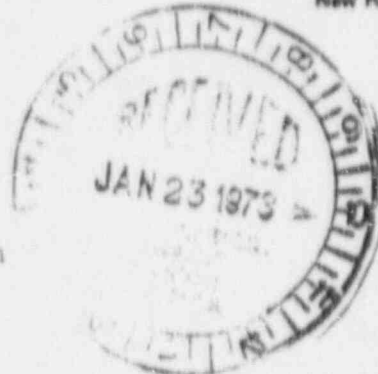
GULF UNITED
NUCLEAR FUELS CORPORATION

January 19, 1973

P. O. Box 606
New Haven, Connecticut 06503
203-777-7641

In Reply Refer to: RA:LM-73-18

Mr. Richard B. Chitwood, Chief
Fuel Fabrication and Reprocessing Branch
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545



Subject: Organization Changes and Clarification of Possession Limits

Reference: AEC License No. SNM-871, Docket 70-903

Dear Mr. Chitwood:

Gulf United Nuclear Fuels Corporation requests amendment to the referenced license to (1) reflect recent organization changes which have been instituted to strengthen the overall health and safety at the Eastview and Pawling facilities and (2) clarify possession limits by removing the use of formulas while retaining the existing upper values at Pawling and (3) increasing the possession limit at Eastview.

In summary, the requested changes cover the following:

1. Formation of a Plutonium Operation under the Manufacturing Vice-President. This Operation includes the Plutonium Laboratory and Engineering Building at the Pawling site.
2. Formation of Gulf United Services.
3. Placement of the NIS and NMM Representatives, Plutonium Operation under the Plutonium Operation Plant Manager.
4. Redesignation of the Health and Safety Director as a NIS Representative.
5. Clarification of possession limits at Pawling within the existing approved upper values.
6. Increasing the possession limit at Eastview to 130 kgs U-235.

100-90-406
100-90-406

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Mr. Richard B. Chitwood, Chief

-2-

RA:LM-73-18

January 19, 1973

It should be noted that Mr. Peter Loysen will continue to act as Health and Safety Director until February 5, 1973, when Mr. Harold Clow will assume the responsibility as NIS Representative, Plutonium Operations. Please remove the resumes for Messrs. John D. O'Toole and Percy Clemons since they are no longer associated with Gulf United.

Although the Pawling possession limits fall within existing approved upper limits, the qualities of plutonium and U-235 have been changed to reflect the ratio of materials anticipated in future development efforts. The new ratios are approximately 80% plutonium materials vs 20% U-235.

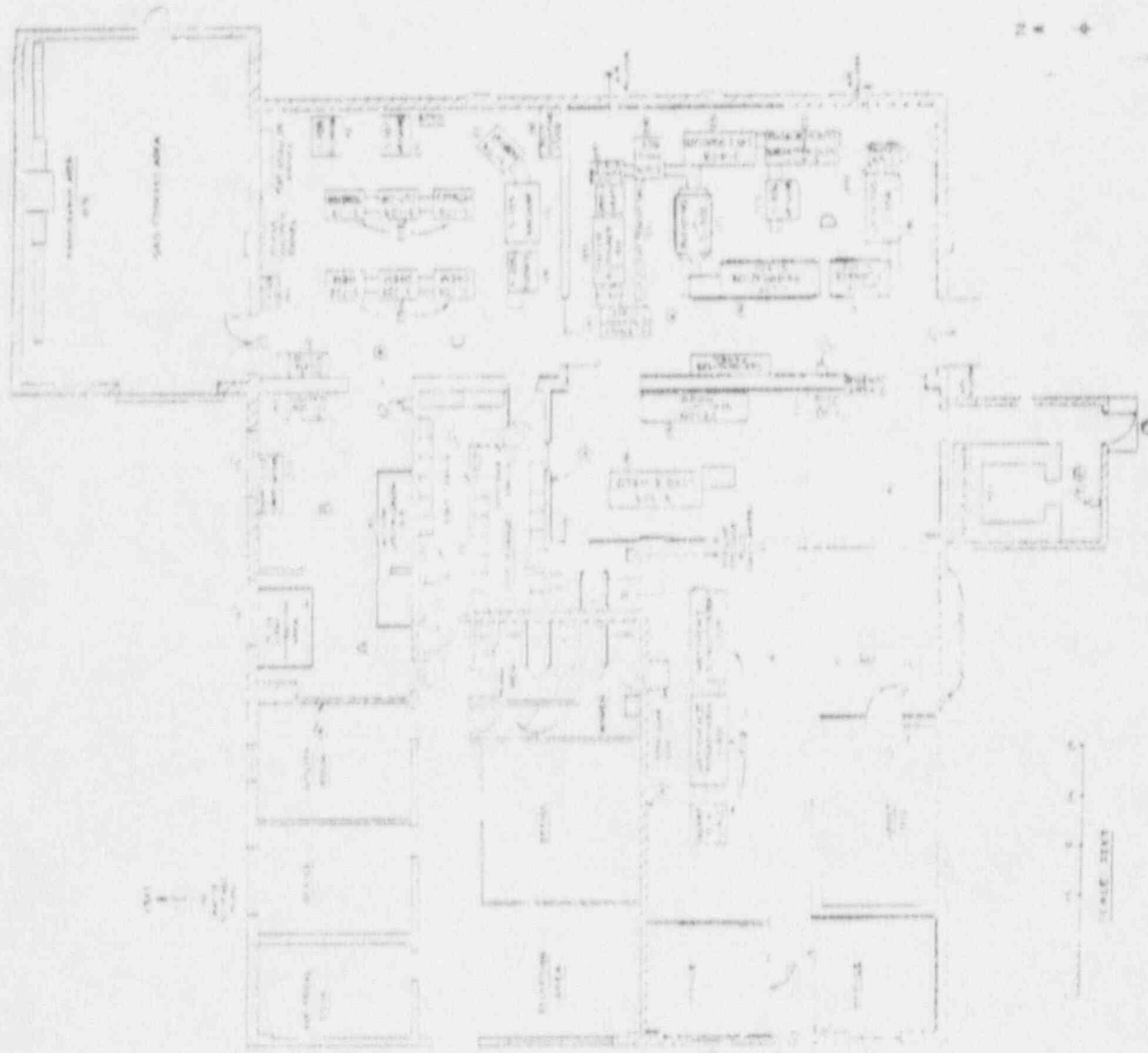
This application has been prepared in the technical specification format used by Gulf United in its renewed application for AEC License No. SNM-33. Thus, Sections 100 and 200 are included in their entirety for convenience, although we recognize that you cannot approve those parts of Section 200 dealing with internal health and safety reviews and approvals until subsequent sections are submitted. Gulf United plans to supercede all of the renewal application LIC-64-3 (Revised) by April 15, 1973. Also attached is a listing which relates portions of Sections 100 and 200 to the previous renewal application and the existing license.

It is requested that this application be given the highest priority over other pending Gulf United applications. Approval is requested by February 2, 1973, to allow for subsequent equipment rearrangements planned to improve material handling and safety of operations at Pawling.

Sincerely,


Robert E. Kropp
Licensing Manager

REK:vw
Attachments



IRVING THOMSON LABORATORY

Room No.	Room Name	Area (sq. ft.)	Notes
1	RECEPTION AREA	100	
2	OFFICE AREA	200	
3	LABORATORY AREA	300	
4	STORAGE AREA	150	
5	RESTROOMS	50	
6	LABORATORY AREA	250	
7	STORAGE AREA	100	
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47	STORAGE AREA	100	
48	LABORATORY AREA	200	
49	STORAGE AREA	150	
50	LABORATORY AREA	250	

Irving Thomson
Laboratory
2000-2001, Dec. 1907

1. The building was designed by
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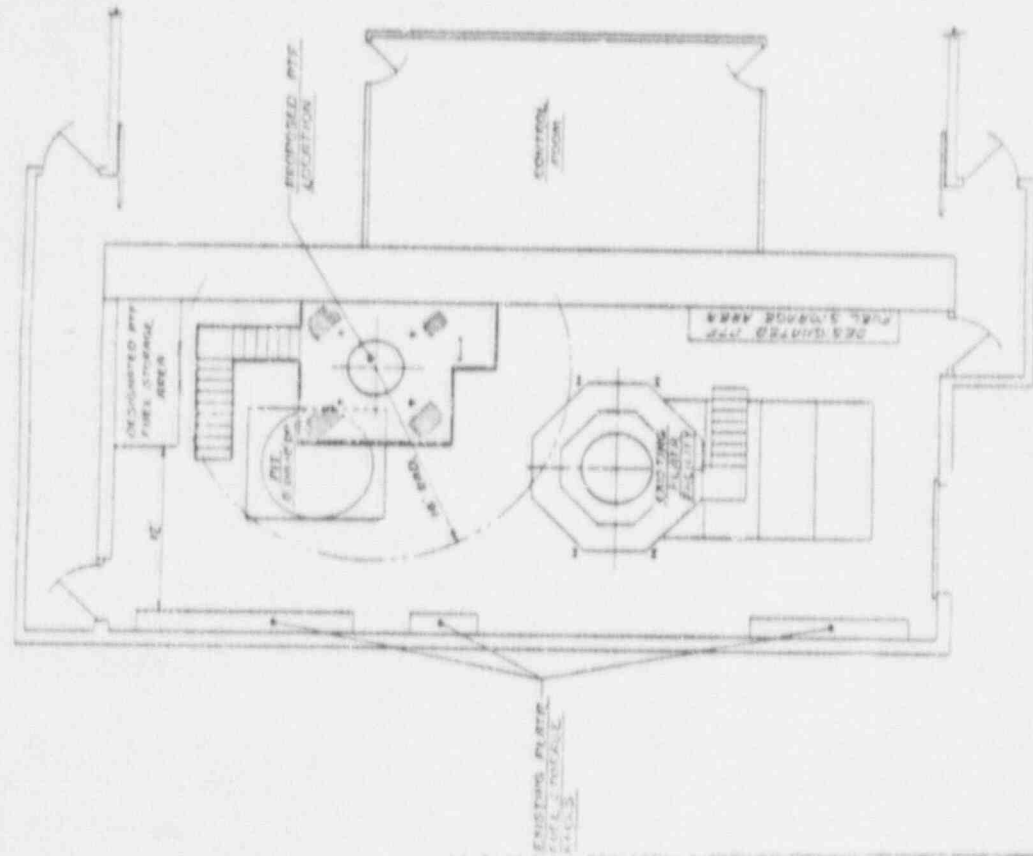
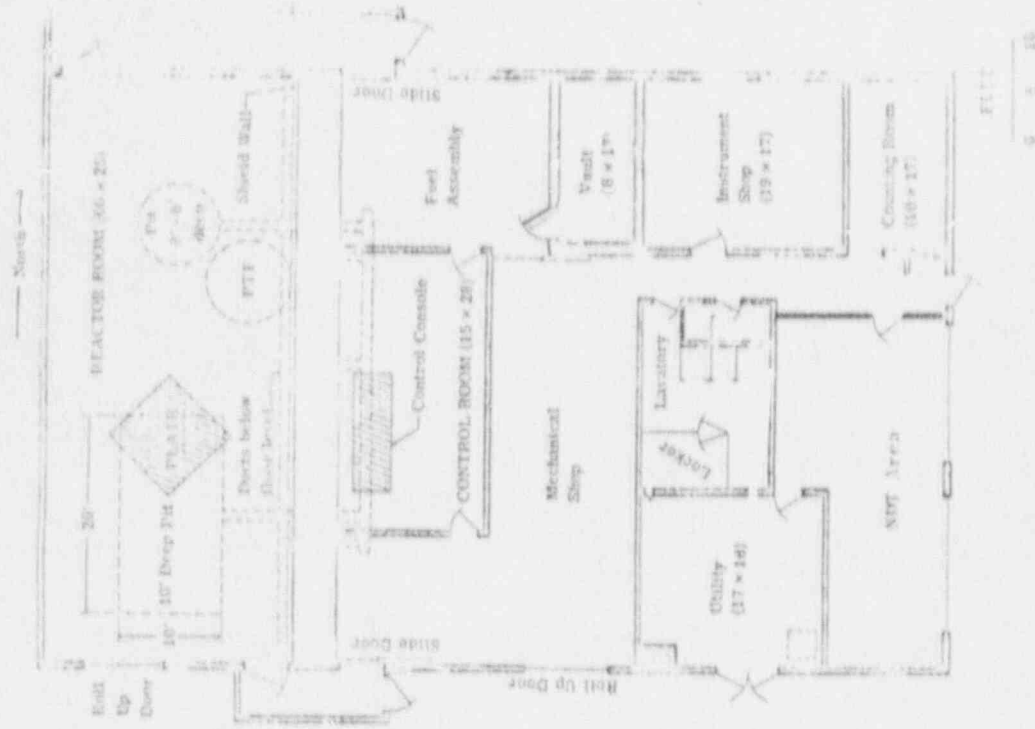


Fig. 5 — Critical Exposed Utility Building — Floor Plan with Revised Detail of Reactor Room
 SMM-871, Sheet 70-903

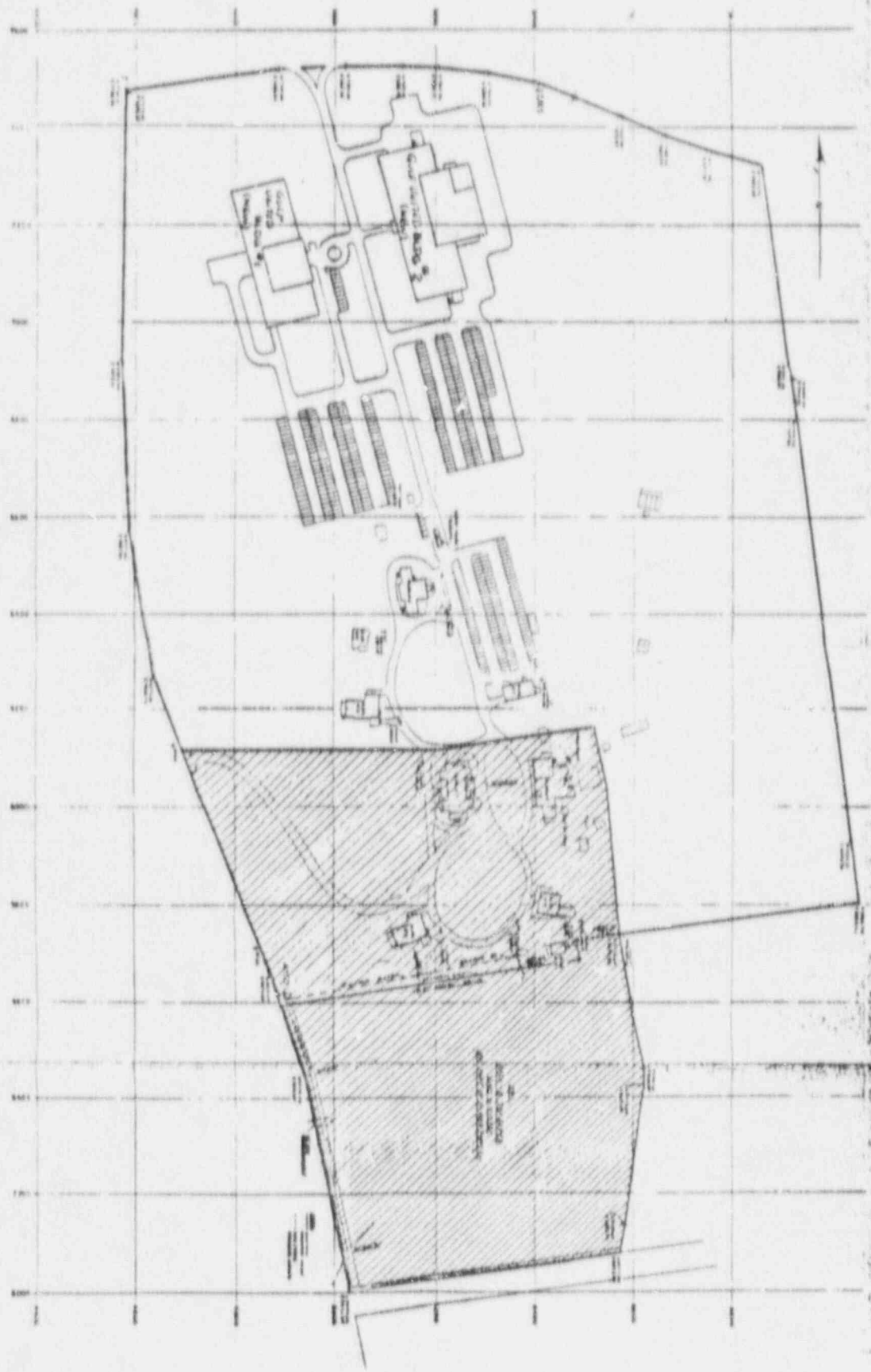


Fig. 6 — GSI United — Eastview Site
 SSM-571, Docket 79-901

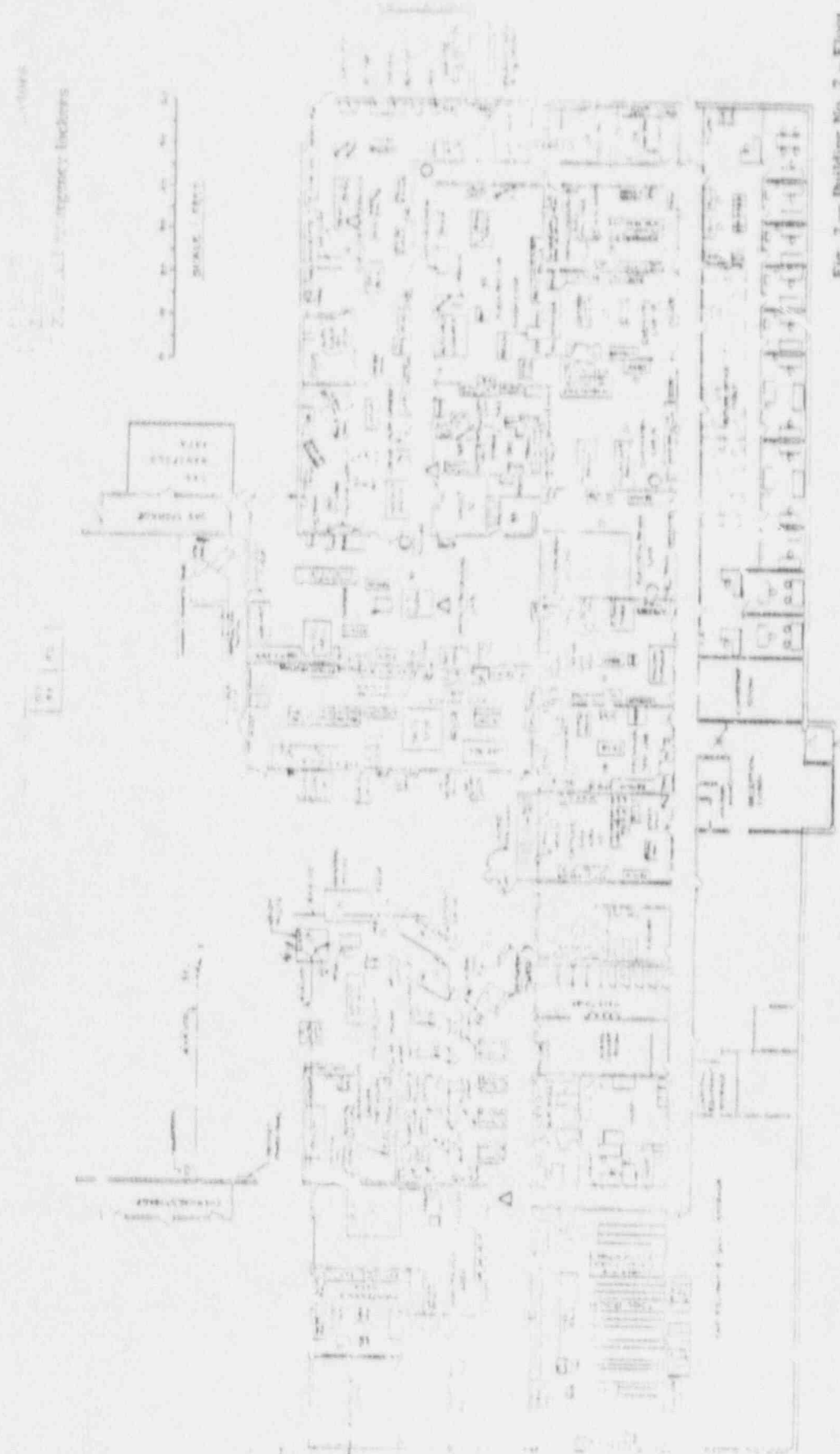
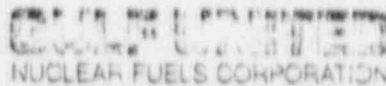


Fig. 7 — Building No. 2 — Floor Plan and Equipment Layout

SNW-871, Docket 70-903



POSITION Consultant Engineer, Nuclear Design Department (Member
Nuclear Criticality Safety Computer Calculation Review Co

PERSON Peter Buck

EXPERIENCE

Dr. Buck has over fifteen years of experience in both experimental and theoretical determinations of nuclear characteristics of power reactors and critical assemblies. His experience also includes fuel management for reload cores.

FORMER POSITIONS

1969-1971 Consultant Engineer, United Nuclear Corporation,
Research and Engineering Center

1965-1969 Manager, Utility Core Analysis Section, United
Nuclear Corporation, Research and Engineering
Center

1957-1965 General Electric Company, Knolls Atomic Power
Laboratory

EDUCATION

B. A. Bowdoin College, Physics, 1951

Ph.D. Columbia University, Physics, 1958

ORNL LIMITED
NUCLEAR FUELS CORPORATION

POSITION: Manager, Nuclear Engineering Department (Member, Nuclear Criticality Safety Computer Calculation Review Committee)

PERSON: James R. Tomonto

EXPERIENCE

Mr. Tomonto has over eighteen years of experience directing and performing reactor core design activities, including reactor physics, thermal-hydraulic analysis, fuel management, shielding, economic evaluation and criticality safety evaluations.

FORMER POSITIONS

1964 - 1971 Manager, Nuclear Engineering Department, United Nuclear Corporation, Research and Engineering Center

1959 - 1964 General Electric Company, Knolls Atomic Power Laboratory

EDUCATION:

B.S. Villanova University, Physics, 1954

M.S. Rensselaer Polytechnic Institute, Reactor Physics, 1959

Knolls Atomic Power Laboratory, Advanced Reactor Engineering Program, 1962

Issued 1/19/73

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION

Advisory Scientist (Member, Nuclear Criticality Safety
Computer Calculation Review Committee)

PERSON

Walter L. Brooks

EXPERIENCE

Dr. Brooks has over twenty-six years of experience in reactor experimentation, operation and control. He has developed unique instrumentation and techniques for experimental reactor and other programs. Dr. Brooks is a licensed senior reactor operator and supervisor of the company's two reactors.

FORMER POSITIONS

1953-1971	Advisory Scientist, United Nuclear Corporation, Research and Engineering Center
1948-1953	Physics Researcher, New York University, Millimeter Wave Project
1946-1947	Instructor in Physics, Lincoln Memorial University

EDUCATION

B. A.	Lincoln Memorial University, Mathematics, 1943
M. S.	New York University, Physics, 1950
Ph.D.	New York University, Physics, 1953

REVISED SUBSECTION NUMBERS

AEC LICENSE NO. SNM - 871, DOCKET 70-903

<u>Revised Renewal Application</u>	<u>Replaces In Renewal Application LIC-64-3 (Revised)</u>	<u>Replaces in Approved License LIC-64-2 (Revised)</u>
Subsection 101	Section 1 - pp. 1-2	Section 1 - pg. 1
Subsection 102	Section 2 - pp. 3-14 Figures 1 through 8 - pp. 180-188	Section 2 - pp. 3-11 Figures 1 through 7 pp.105-11
Subsection 103	Section 3 - pp. 15-17 Section 4 - pp. 18-20 Appendix D - pp. 152-155	Section 3 - pp. 13-15 Section 4 - pp. 17-18
Subsection 104	Section 3 - pp. 15-17 Appendix D - pp. 152-155	Section 3 - pp. 13-15
Subsection 201	Section 6 - pp. 23-26 Figure 9 - pg. 188	Section 6 - pp. 21-24 Figure 8 - pg. 117
Subsection 202	Section 9 - pp. 35-45 Appendix D - pp. 132-141 Figure 10 - pg. 189	Section 9 - pp. 33-34 Figures 9 & 10 - pp. 119-120
Subsection 203	Section 6 - pg. 26	Section 6 - pg. 23
Subsection 204	Section 3 - pp. 15-17 Figure 10 - pg. 189	Section 3 - pp. 13-15 Figures 9 & 10 - pp. 119-120
Subsection 205	Section 9 - pp. 46-50	Section 9 - pp. 34-38
Subsection 206	Section 9 - pp. 35-45	Section 9 - pp. 33-34
Subsection 207	Section 9 - pp. 35-45	Section 9 - pp. 33-34
Subsection 208	Section 9 - pp. 35-45	Section 9 - pp. 33-34

GULF UNITED

NUCLEAR FUELS CORPORATION

Section 100 - General Information

SUBSECTION 101	GENERAL
SUBSECTION 102	LOCATION AND FACILITIES
SUBSECTION 103	SUMMARY OF ACTIVITIES
SUBSECTION 104	SOURCE AND SPECIAL NUCLEAR MATERIALS POSSESSION LIMITS

License: SNW-871 Docket: 70-803 Section: 100 Subsection/Subpart: _____

Subject: GENERAL INFORMATION - Table of Contents

Issued: 1/18/73 Supersedes: 5/30/72 Approved: _____ Page 1 of 1

GULF UNITED

NUCLEAR FUELS CORPORATION

101. General

1. Introduction

This manual has been prepared to provide the information required by the Atomic Energy Commission regulations 10 CFR 20, 10 CFR 70, and 10 CFR 71 for renewal of special nuclear material license SNM-871. The manual outlines the Gulf United Nuclear Fuels Corporation practices, guides, procedures and controls applied to insure the safe handling of special nuclear materials at its facilities at Elmsford and Pawling, New York.

2. Corporate Information

The Gulf United Nuclear Fuels Corporation, a Delaware corporation, maintains headquarters at Elmsford, New York. The Corporation is a joint venture corporation of Gulf Oil Corporation and United Nuclear Corporation for the purpose of designing, manufacturing and selling nuclear fuel for light water nuclear power reactors and certain types of research reactors. Facilities include Corporation Offices and Engineering Operation at Elmsford, New York; Manufacturing and Engineering Operation at Pawling, New York; Chemical Operations at Hematite, Missouri; Fabrication Operation at New Haven, Connecticut; and Reactor Component Manufacturing facilities at San Diego, California and Tijuana, Mexico.

3. Officers

Corporate Officers are:

President

Arnold R. Fritsch

Vice President,
Utility Fuel Engineering

Edward A. Dean

Vice President,
Manufacturing

Fred G. Stengel

License: SNM-871 Docket: 20-903 Section: 100 Subsection/Subpart: 101

Subject: GENERAL INFORMATION - General

Information on this document is related
to the following document information
100-406

Issued: 1/19/73 Supersedes: 5/30/72 Approved: 90-406 Page 1 of 2

GULF UNITED

NUCLEAR FUELS CORPORATION

101. General

3. Officers (continued)

Vice President,
Marketing

Leo Macklin

Vice President, Treasurer
& Secretary

Kenneth L. Wiley

All of the officers are United States citizens. There will be no known control or ownership exercised over Gulf United Nuclear Fuels Corporation by any alien, foreign corporation or foreign government.

Information in this record was deleted
by [redacted] and Freedom of Information
Act, [redacted]
FOIA- 90-406

License: SNM-871 Docket: 70-903 Section: 100 Subsection/Subpart: 101

Subject: GENERAL INFORMATION - General

Issued: 1/19/73 Supersedes: 5/30/72 Approved: _____ Page 2 of 2

GULF UNITED

NUCLEAR FUELS CORPORATION

102. Location and Facilities

Gulf United Nuclear Fuels Corporation occupies two buildings in the Eastview area of Elmsford, New York. The first houses administrative, engineering, physics, and mathematics personnel. It contains approximately 40,000 square feet of working area. The second building is a combined laboratory, shop, and office facility, comprising approximately 45,000 square feet of working area. It houses the experimental groups including chemistry and materials and the shop personnel.

Gulf United has research and development activities 50 miles north of Elmsford on Route 55 at Pawling, New York. On this 1169-acre site, the Company has a Plutonium Laboratory building, a Critical Experiment Facility, and an Engineering Building, the latter consisting of a Chemistry Laboratory, Health and Safety Laboratory, and offices. This site has been in operation for about 15 years. All standard and emergency services are adequate for the present facilities and have been designed for easy expansion whenever the need arises. All Gulf United facilities have been cleared for Department of Defense Secret and Atomic Energy Commission Restricted Data and are provided with suitable surveillance.

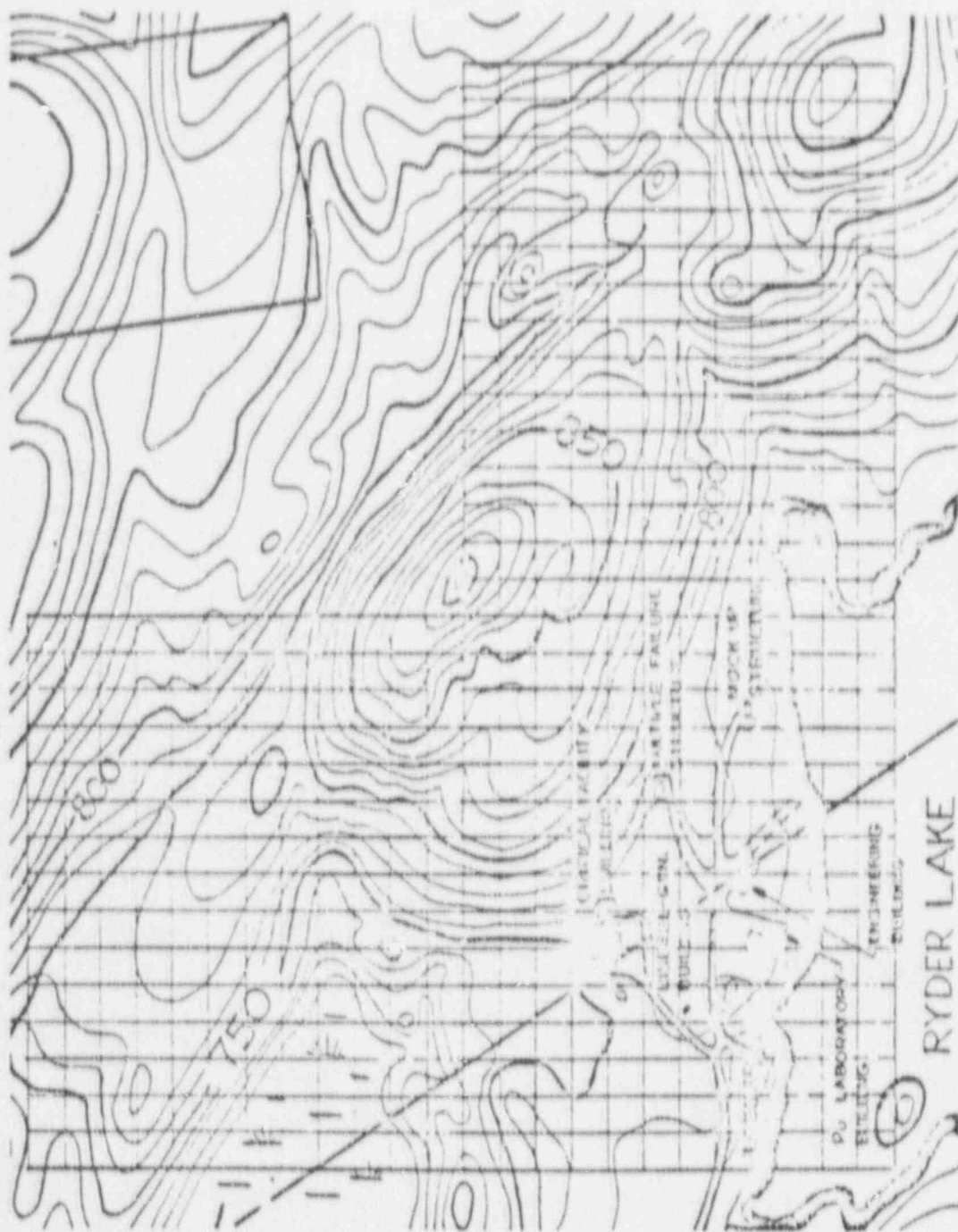
The general arrangement of the facilities and buildings are shown in the following listed figures:

- Fig. 1 - Pawling Nuclear Experiment Station and Surrounding Area
- Fig. 2 - Pawling Nuclear Experiment Facility - Site Plan
- Fig. 3 - Pawling Plutonium Laboratory
- Fig. 4 - Pawling Engineering Building
- Fig. 5 - Critical Experiments Facility Building - Floor Plan with Revised Detail of Reactor Room
- Fig. 6 - Eastview Site
- Fig. 7 - Building No. 2 - Floor Plan and Equipment Layout

License: SW-871 Docket: 70-902 Section: 100 Subsection/Subpart: 102

Subject: GENERAL INFORMATION - Location and Facilities

Issued: 1/18/73 Supersedes: 5/30/72 Approved: _____ Page 3 of 3





(30) — TO
NORTH STRUCT
TEST AREA

NOTES:

- ① FLOOR TO CEILING WALL FIREPROOF MATERIAL
- ② ALL FLOORS VINYL-ASBESTOS TILE
- ③ DOUBLE DOORS - CONTROLLED ACCESS
- ④ GASTIGHT DOOR - CONTROLLED ACCESS
- ⑤ GASTIGHT DOOR - EMERGENCY EXIT ONLY
- ⑥ CONTROLLED ACCESS DOOR
- ⑦ SEALED WINDOW
- ⑧ FLOOR TO CEILING STEEL WALL
- ⑨ DRAIN FROM SINK AND SHOWER TO WASTE EFFLUENT
- ⑩ BUILDING BASEMENT
- ⑪ CRITICALITY ALARM AND DETECTOR
- ⑫ COMBINATION LOCK VAULT DOOR
- ⑬ CRITICALITY ALARM REMOTE DETECTOR
- ⑭ CONTROLLED AREA - SHOWN WITHIN CROSS-HATCHED WALLS

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CRITICALITY ZONE TABLE

NO.	BOX	NAME
1	S-102	VACUUM BOX
1	S-104	FABRICATION BOX
2	S-105	CUTOFF BOX
2	S-106	METALLOGRAPHY BOX
2	S-109	TRANSFER BOX
2	S-107	WEIGHING BOX
4	S-108	DECONTAMINATION BOX
5	S-111	OXYGEN ANALYSIS BOX
6	S-112	X-RAY DIFFRACTION AREA
7	S-202	CHEMISTRY BOX
7	S-203	CHEMISTRY BOX
7	S-204	CHEMISTRY BOX
8	S-205	RESEARCH FURNACE BOX
9	S-206	COUNTING
10	ROOM 2	FURNACE
11	ROOM 3	CHEMISTRY
12	S-312	GAS EVOLUTION BOX
13	-	RADIOGRAPHY AREA
14	S-313	EMISSION SPECTROGRAPH
15	S-300	PILDT FURNACE BOX
16	S-301	PILDT FABRICATION BOX
17	S-302	BLENDING BOX
18	S-304	CENTERLESS GRINDING BOX
19	S-305	LOAD & WELD BOX
20	S-306	CLEANING BOX
21	S-404	WEIGHING BOX
22	S-407	BLENDING & AGGLOMERATION BOX
23	S-408	DRY & GRANULATION BOX
24	S-409	PRESS BOX
25	S-410	FURNACE ENTRANCE BOX
26	S-411	SINTERING FURNACE
27	S-412	FURNACE DISCHARGE
28	-	BIL-LEVEL TRANSFER TUNNEL
29	ROOM 4	DECONTAMINATION
30	ROOM 5	FUME
31	S-507	WET CHEMISTRY BOX I
32	S-508	WET CHEMISTRY BOX II
33	S-509	BALANCE BOX
34	-	VAULT
35	-	NDT AREA
36	-	WASTE STORAGE BLDG
37	-	PASSIVE ASSAY
38	-	EQUIPMENT STORAGE BLDG (WASTE WATER)

N

Lawling Plutonium
Laboratory

SNK-871, Do

SNM-871, Docket 70-903



Fig. 4 — Pawling Engineering Building

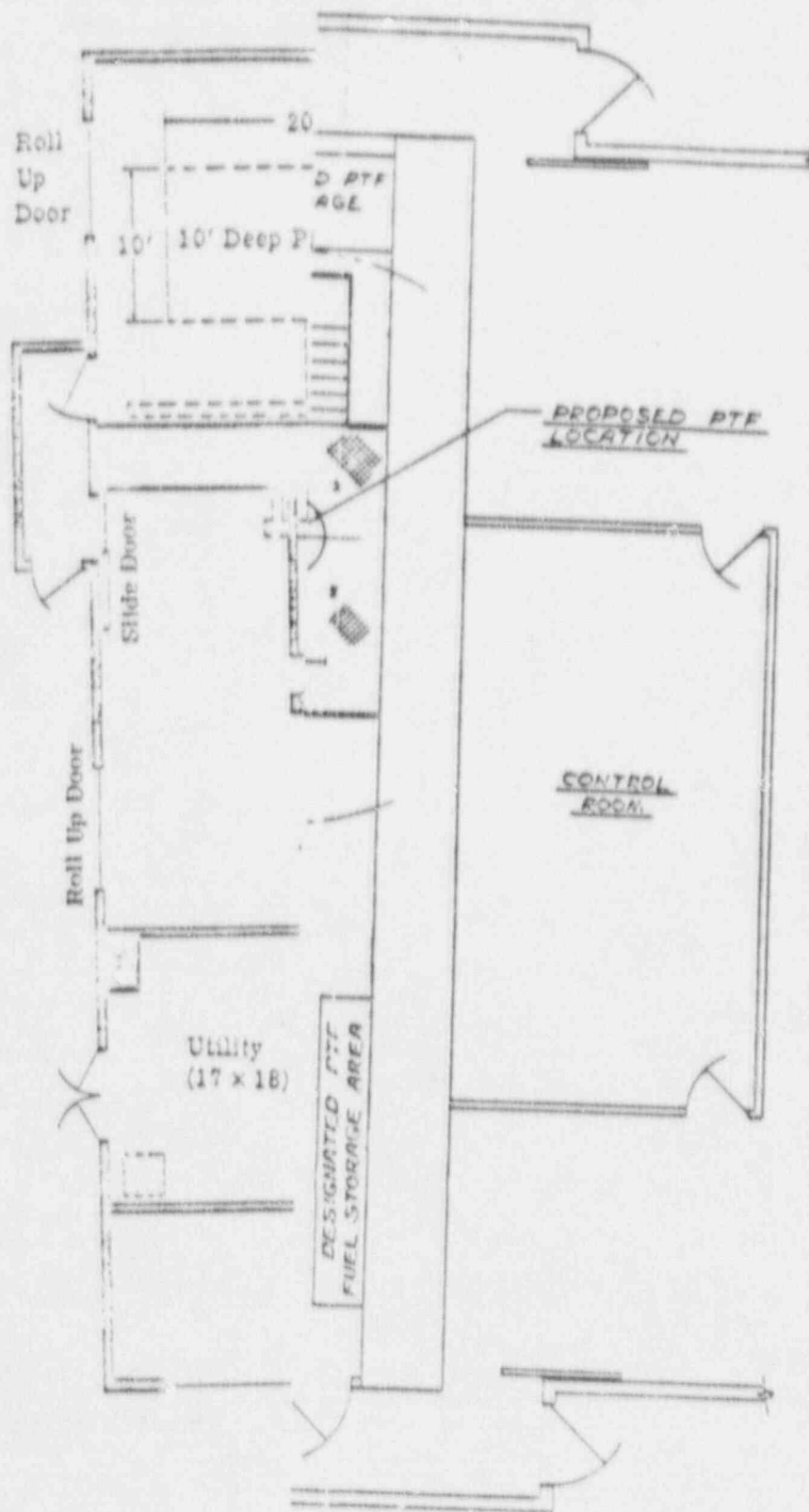


Fig. 5 — Critical Experiment Facility Building — Floor Plan with Revised Detail of Reactor Room

SNM-671, Docket 70-903

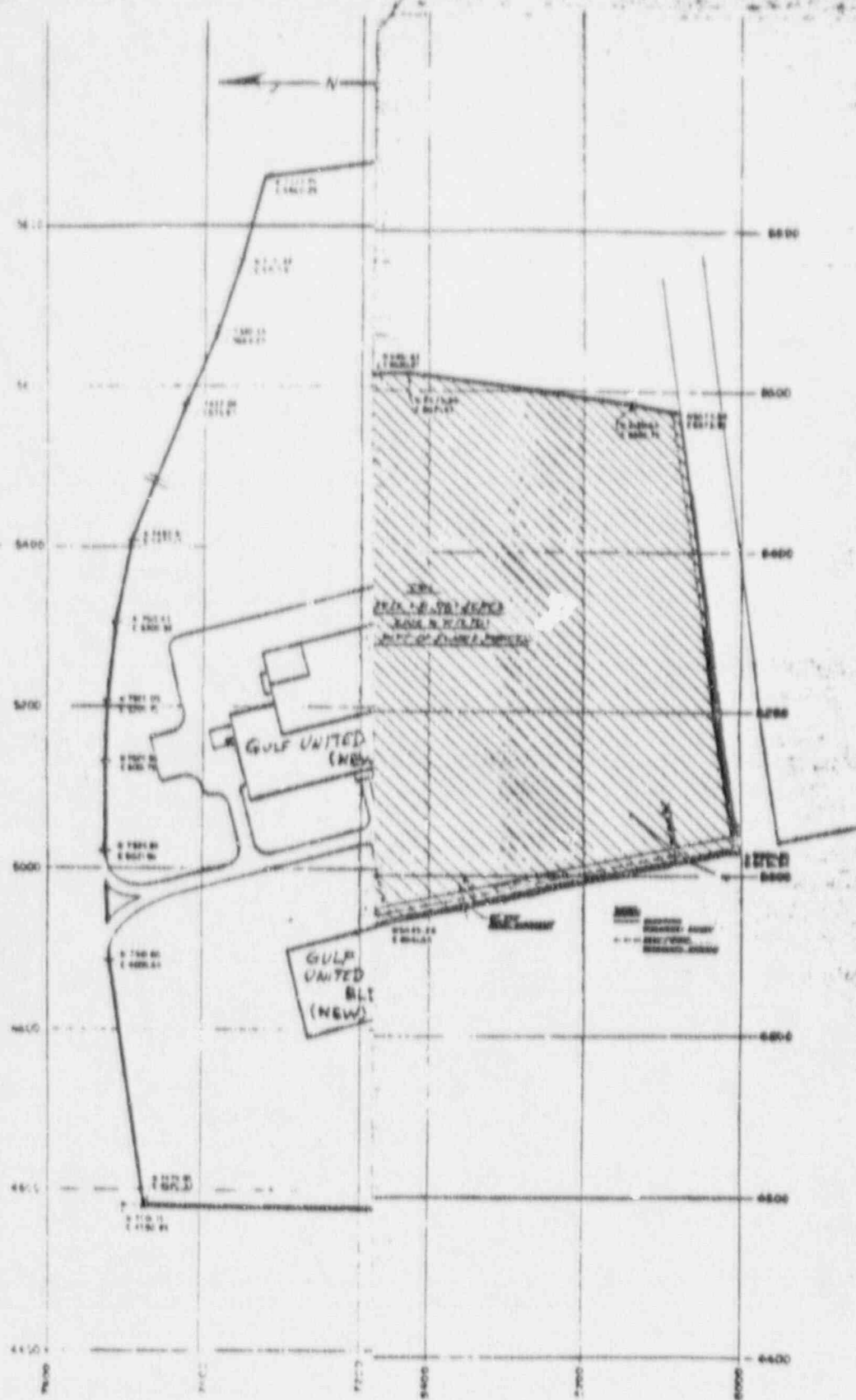
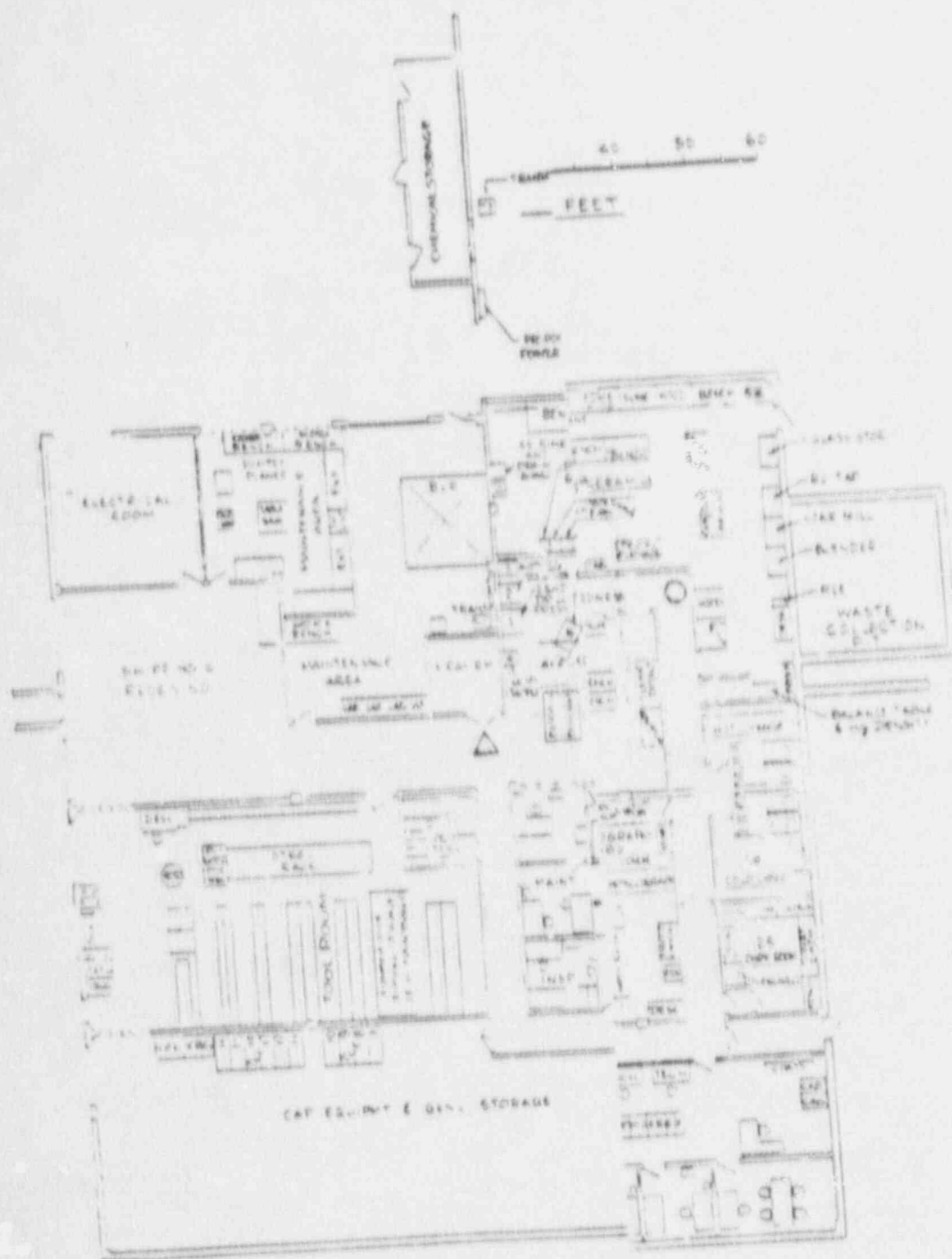


Fig. 6 — Gulf United — Eastview
ite

SNN-571, Docket 70-903

agency lockers



7 — Building No. 2 - Floor
and Equipment Layout

SNM-871, Docket 70-903

GULF UNITED

NUCLEAR FUELS CORPORATION

103. Summary of Activities

SNM bearing materials are received, handled, stored, processed and shipped in accordance with Regulations of the Atomic Energy Commission or as provided by this license. Activities include research, development, and production using various types of SNM bearing material. The description of these materials is listed below by area that will use them.

1. Pawling Facilities

1.1 Plutonium Laboratory

The chemical forms are various plutonium containing materials, such as plutonium metal, plutonium carbides and oxides, etc., and various uranium materials, such as uranium metal, uranium carbides and oxides, uranium solutions, etc.

The physical form of these materials will be powders, solid compacts, and solutions. Some of these powders will be pyrophoric in air. Both oxygen and moisture in the atmosphere will cause oxidation. Therefore, the atmosphere surrounding these pyrophoric powders will be kept inert and of a purity that will not produce significant reactions. The purity required by technological considerations to prevent slow oxidation is generally greater than that required to prevent spontaneous ignition.

Processing includes fabrication of un-clad shapes, loading of clad components such as rods, and characterization and property measurements of the materials.

1.2 Engineering Building

Only depleted or natural uranium will be received or processed in the Engineering Building.

Doc: SNM-871 Docket: 70-903 Section: 100 Subsection/Subpart: 102

Subject: GENERAL INFORMATION - Summary of Activities

Issued: 1/19/72 Supersedes: 5/30/72 Approved: _____ Page 1 of 3

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION

Manager, Uranium Fuel Development Laboratory

PERSON

Nathan Fuhrman

EXPERIENCE

Dr. Fuhrman has twenty years experience in materials technology of which the past fourteen years have been in the area of nuclear applications. Responsibilities have included the research and development of high loaded refractory metal matrix cermet fuel, partial coating of uranium fuels, and low temperature sintering of uranium fuels. Other assignments have included evaluation of process specifications for various nuclear fuel materials.

FORMER POSITIONS

1959 - Present	Manager, Chemistry and Ceramics, Gulf United (formerly United Nuclear, REC)
1957 - 1959	Supervised the development of a vapor deposition process for the production of silicon from silan, Lansdale Tube Company, Division of Philco Corporation
1954 - 1957	Development, Sylvania Corning Nuclear Corporation
1953 - 1954	Research, Polytechnic Institute of Brooklyn

EDUCATION

B.Ch.E.	Rensselaer Polytechnic Institute, 1949
Ph.D.	Polytechnic Institute of Brooklyn, 1953 (Physical Chemistry)

ISSUED: 1/19/73

GULF UNITED

NUCLEAR FUELS CORPORATION

103. Summary of Activities

1. Pawling Facilities (continued)

1.3 Critical Facility

For the purpose of this license, this area is included for storage and non-destructive test operations.

2. Eastview Facilities

The processing of special nuclear materials at the Eastview site will be confined to Building 2. The materials to be processed will include uranium and/or plutonium both as elements or compounds, such as UO_2 , UC , UC_2 , and UF_4 . Physically, these materials will be primarily particulate or consolidated solids, but also may include solutions containing uranium compounds.

No unclad plutonium-bearing material will be processed at the Eastview site at any time. The cladding on plutonium-bearing materials will be stainless steel or other metal or alloy, welded leaktight and helium leak-checked.

2.1 Uranium Fuel Development Laboratory

The processing of unclad uranium-bearing material will be confined to the Uranium Fuel Development Laboratory with the exception of small samples which may be taken for chemical analysis, metallographic examination, or testing. In these cases, care will be taken to prevent spread of alpha activity.

The Uranium Fuel Development Laboratory will conduct research and development and pilot plant studies, the fabrication of ceramic fuel, the manufacture of cermet fuel, the casting and subsequent working of uranium-containing alloys, the testing of various uranium-containing fuels, and the metallography of various uranium-containing fuels.

License: SNM-871 Docket: 20-903 Section: 100 Subsection/Subpart: 103

Subject: GENERAL INFORMATION - Summary of Activities

Issued: 1/19/73 Supersedes: 5/22/72 Approved: _____ Page 2 of 3

GULF UNITED

NUCLEAR FUELS CORPORATION

103. Summary of Activities

2. Eastview Facilities (continued)

2.2 Material Technology Laboratories

Typical operations will consist of testing procedures applied to a fuel rod which has been loaded in the Uranium Fuel Development Laboratory and sealed at one end. A plug will be placed in the open end as the rod is transported between laboratories. An example of operations performed on the uranium-containing rods will involve analyses of gases contained in a sealed as-fabricated fuel rod containing uranium compounds only, with gas samples obtained by puncturing the fuel rod.

Testing of unirradiated fuel rods containing uranium only may be handled outside of the Uranium Fuel Development Laboratory. These operations will be performed in the Electron Beam Laboratory utilizing the welding glove box, and in the Chemistry Laboratory. Testing will be limited to one fuel rod at any one time, containing not more than 75 g of U^{235} .

License: SNM-871 Docket: 70-803 Section: 100 Subsection/Subpart: 103

Subject: GENERAL INFORMATION - Summary of Activities

Issued: 1/19/72 Supersedes: 5/22/72 Approved: _____ Page 2 of 3

GULF UNITED

NUCLEAR FUELS CORPORATION

104. Source and Special Nuclear Material Possession Limits

1. Pawling Facilities

1.1 Plutonium Laboratory

1.1.1 600 kgs Pu

1.1.2 160 kgs U-235

1.2 Critical Facility

1.2.1 160 kgs Pu

1.2.2 40 kgs U-235

1.2.3 Approximately 5 kgs of Pu plus 150 kgs of contained U-235 in the form of low enrichment fuel may be stored in the Reactor Room of the Critical Facility under AEC License No. CX-25.

2. Eastview Facilities

2.1 12 kgs Pu in the form of clad rods and components

2.2 150 kgs of U-235 without restriction as to the chemical or physical form.

License: SNM-871 Docket: 70-903 Section: 100 Subsection/Subpart: 104

Subject: GENERAL INFORMATION - Source and Special

Nuclear Materials Possession Limits

Issued: 1/19/73 Supersedes: 5/30/72 Approved: _____ Page 1 of 1

GULF UNITED

NUCLEAR FUELS CORPORATION

Section 200 - ORGANIZATION, PERSONNEL AND ADMINISTRATION

SUBSECTION 201	CORPORATE ORGANIZATION
SUBSECTION 202	NUCLEAR AND INDUSTRIAL SAFETY ORGANIZATION
SUBSECTION 203	NUCLEAR MATERIALS MANAGEMENT
SUB-SECTION 204	ENGINEERING AND MANUFACTURING OPERATIONS ORGANIZATION
SUBSECTION 205	OPERATING POLICIES AND PROCEDURES
SUBSECTION 206	NUCLEAR AND INDUSTRIAL SAFETY CONTROL
SUBSECTION 207	INSPECTIONS AND AUDITS
SUBSECTION 208	TRAINING

License: SNM-671 Docket: 70-903 Section: 200 Subsection/Subpart: _____

Subject: Organization, Personnel and Administration

Table of Contents

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GULF UNITED

NUCLEAR FUELS CORPORATION

201. Corporate Organization

Gulf United Nuclear Fuels Corporation is organized for efficient management and administration of individual operations at different locations in separate plants or facilities. The Vice President, Manufacturing has the overall responsibility for the Plutonium Operation which includes the Plutonium Laboratory and Engineering Building at Pawling. The Vice President, Utility Fuels Engineering has the overall responsibility for the Uranium Fuel Development Laboratory and the General Manager, Gulf United Services has the overall responsibility for the Material Technology Laboratories. These Vice Presidents and General Manager report to the President of Gulf United Nuclear Fuels Corporation as shown on Figure 201-1.

The organization of the Corporation provides for administration, production, technical support, nuclear and industrial safety and nuclear materials management on a corporate-wide as well as Operation-wide basis.

Personnel having health and safety responsibilities will be selected by management based on their qualifications. The selection of these personnel requires approval of two levels of management above the position being filled.

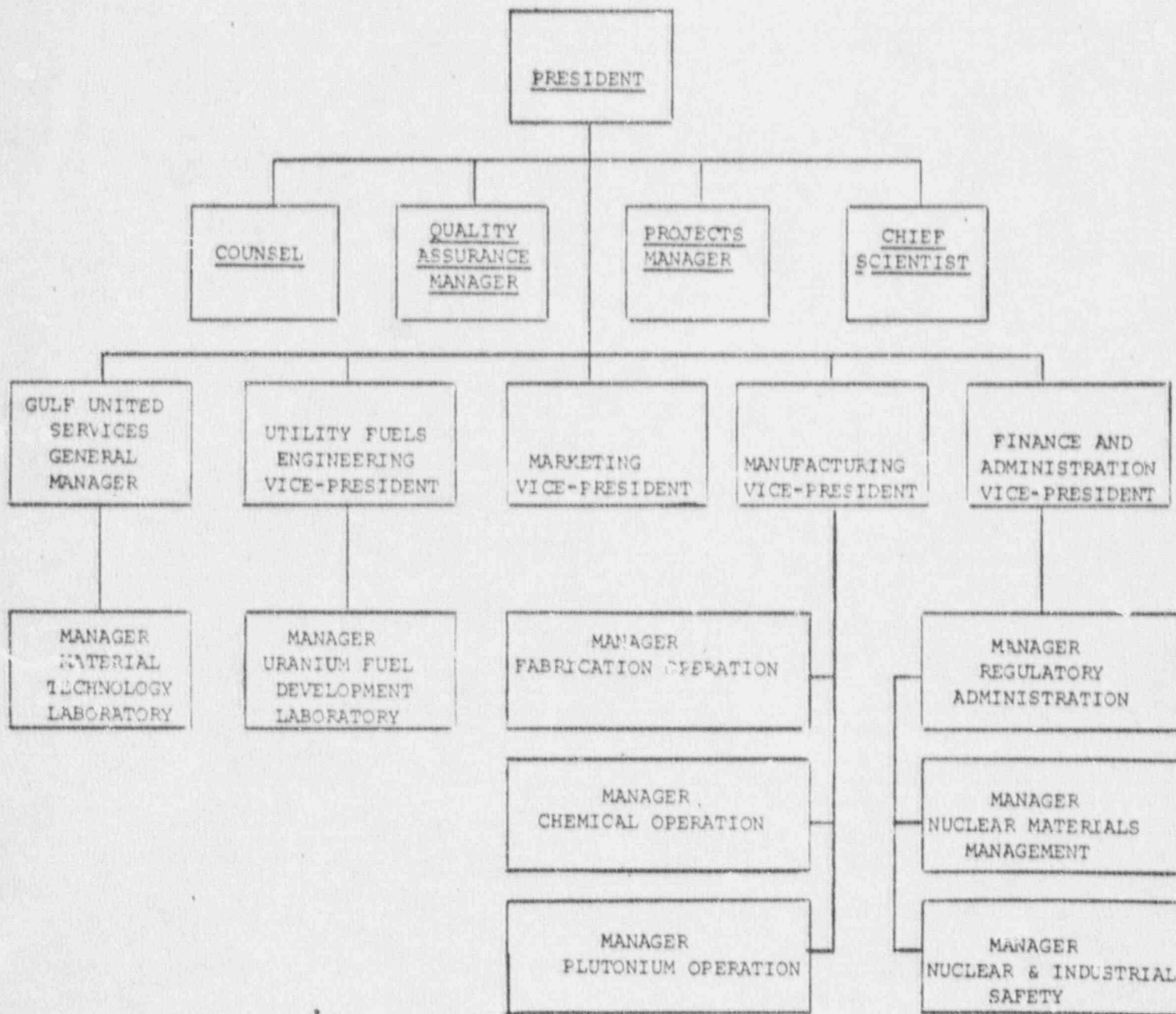
License: SNM-B71 Docket: 70-903 Section: 200 Subsection/Subpart: 201

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Corporate Organization

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GULF UNITED

NUCLEAR FUELS CORPORATION



License: SNM-871 Docket: 70-903 Section: 200 Subsection/Subpart: 201

Subject: Figure 201-I -- Organization Chart, Corporate Organization

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GULF UNITED

NUCLEAR FUELS CORPORATION

202. Nuclear and Industrial Safety Organization

1. Organization

Nuclear and industrial safety is organized to provide a complete program for nuclear criticality safety, health physics, industrial safety and fire prevention, and medical services for the Corporation. This is accomplished by providing operating and staff nuclear and industrial safety groups.

On site nuclear criticality safety, health physics, industrial safety and fire prevention, and medical services control functions are provided by operating nuclear and industrial safety personnel. Figure 204-I shows the arrangement of the operating nuclear and industrial safety group.

Staff nuclear and industrial safety control is provided by the Nuclear and Industrial Safety Department. The Nuclear and Industrial Safety Manager is responsible for the following activities:

- 1.1 Establishment of corporate nuclear and industrial safety policy.
- 1.2 Preparation of Regulatory Agency licenses.
- 1.3 Technical support services, as related to nuclear criticality safety and health physics for review of proposed additions to or modifications of proposed equipment.
- 1.4 Systematic auditing of plant operations.

The Nuclear and Industrial Safety Department organization is shown in Figure 202-I.

Review of nuclear criticality safety calculations is provided by the Nuclear Criticality Safety Computer Calculation Review Committee.

License:	<u>SNM-B71</u>	Docket:	<u>70-903</u>	Section:	<u>200</u>	Subsection/Subpart:	<u>202</u>
Subject:	<u>ORGANIZATION, PERSONNEL AND ADMINISTRATION;</u>						
	<u>NUCLEAR AND INDUSTRIAL SAFETY ORGANIZATION</u>						
Issued:	<u>1/19/72</u>	Supersedes:	<u>5/30/72</u>	Approved:	<u></u>		
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NUCLEAR FUELS CORPORATION

202. Nuclear and Industrial Safety Organization

2. Basic Responsibilities

2.1 Nuclear and Industrial Safety Department Manager

The NIS Department Manager is responsible to ensure effective and timely administration of the nuclear and industrial safety control and audit function. He assists in establishing sound programs in compliance with Corporate Policy and appropriate Federal and State Regulations and ensures continued compliance of these official programs through regular audits and follow-up with responsible Corporate Management. He must provide competent technical support services to each operation from either in-house specialists or from specialists outside of the Corporation on a consulting basis. He will ensure that all nuclear criticality safety computer calculations are reviewed and approved by the Nuclear Criticality Safety Computer Calculations Review Committee.

2.2 Nuclear and Industrial Safety Representative

The Nuclear and Industrial Safety Representative is responsible for daily surveillance of nuclear criticality/industrial safety and health physics at his assigned plant. He initiates NIS Department Nuclear criticality safety and health physics evaluations of proposed modifications to processes and equipment. He may perform preliminary nuclear criticality safety evaluations of these proposed changes. He performs inspections of operating procedures and general plant conditions for the benefit of both the Nuclear and Industrial Safety Department and Operating Personnel. These audits may serve as a management tool for joint action to correct any deficiencies noted.

2.3 Nuclear Safety Specialist

The Nuclear Safety Specialist assists the Department Manager in providing a sound program in compliance with Corporate Policy, Federal and State regulations. He performs nuclear criticality safety evaluations of processes and equipment, plant inspections and follow-up with responsible operating management.

License: SNW-871 Docket: 70-903 Section: 200 Subsection/Subpart: 202

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION;
NUCLEAR AND INDUSTRIAL SAFETY ORGANIZATION

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GULF UNITED

NUCLEAR FUELS CORPORATION

202. Nuclear and Industrial Safety Organization

2. Basic Responsibilities (continued)

2.4 Health Physics Specialist

The Health Physics Specialist assists the Department Manager in providing a sound program in compliance with Corporate Policy, Federal and State regulations. He performs evaluations of radiological safety and plant inspections, and follows up with responsible operating management.

2.5 Consultants

Consultants to the Nuclear and Industrial Safety Department, assist the Department Manager through reviews, technical evaluations, etc., within the area of their specialty. Such assistance is at the request of the Department Manager.

2.6 Nuclear Criticality Safety Computer Calculation Review Committee Members

Members of the Nuclear Criticality Safety Computer Calculation Review Committee are responsible to review and approve all nuclear criticality safety calculations submitted to them.

3. Personnel Qualifications

3.1 Nuclear and Industrial Safety Department Manager

The Nuclear and Industrial Safety Department Manager shall hold a degree in science or engineering and have at least ten years experience in a responsible position in the nuclear industry at least three years of which have been in an activity in which he has performed nuclear criticality safety assessments and has developed an understanding of health physics and industrial safety problems and controls.

3.2 Nuclear and Industrial Safety Department Specialists

Nuclear and Industrial Safety Department Specialists shall have a B.S. Degree in science or engineering and not less

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NUCLEAR FUELS CORPORATION

than three years experience in a responsible nuclear engineering or physics position and not less than one year of experience in the area of their specialty. In addition, the Nuclear Safety Specialist will be required to have at least one year experience in performing nuclear safety assessments.

3.3 Nuclear and Industrial Safety Department Representatives

Nuclear and Industrial Safety Department Representatives shall have a high school diploma and not less than three years experience in the nuclear industry including specific training in nuclear criticality safety, health physics, and industrial safety, and fire prevention.

3.4 Nuclear and Industrial Safety Department Consultants

Nuclear and Industrial Safety Department Consultants shall meet the same requirements as listed for the Specialist.

3.5 Nuclear Criticality Safety Computer Calculation Review Committee Members

Nuclear Criticality Safety Computer Calculation Review Committee Members shall have a B.S. Degree in science or engineering and not less than three years experience in performing and/or reviewing nuclear calculations. An advance degree is preferred.

3.6 Equivalent Experience

Two years responsible and appropriate experience may be considered equivalent to each year of college work. This experience need not cover all phases of the discipline but must contribute to the general field of the discipline.

Resumes of the qualifications of the personnel performing these functions are included as back-up information.

License: SNW-871 Docket: 70-903 Section: 200 Subsection/Subpart: 202

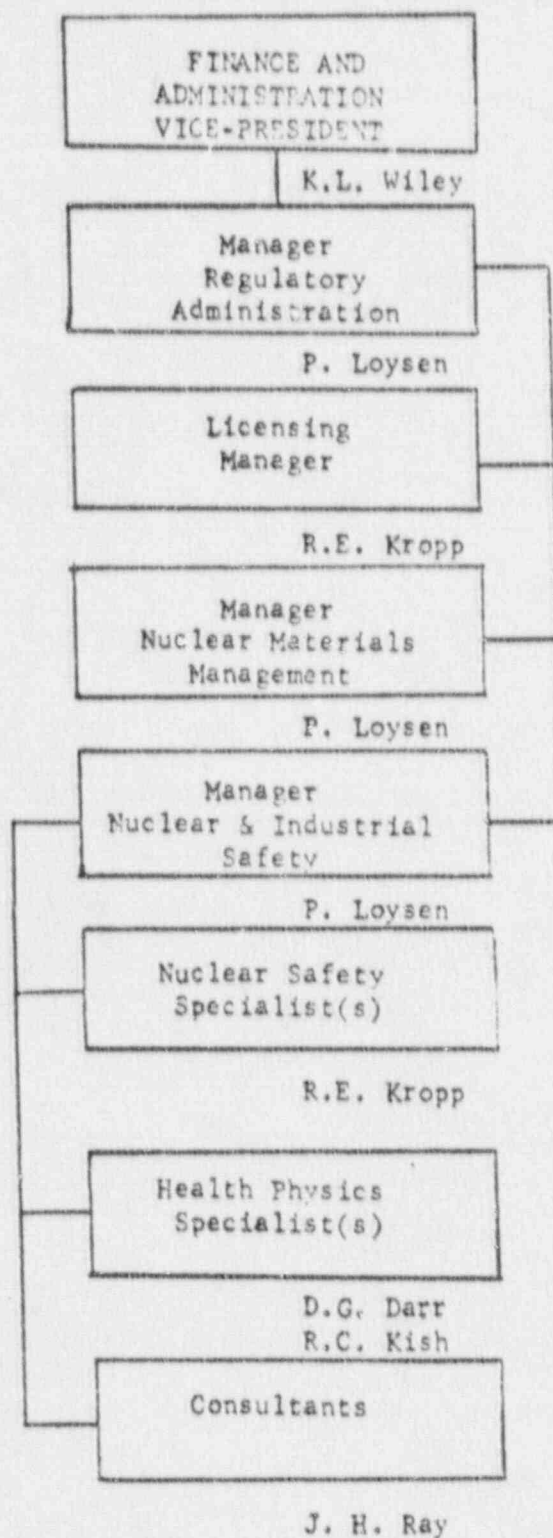
Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION;

NUCLEAR AND INDUSTRIAL SAFETY ORGANIZATION

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NUCLEAR FUELS CORPORATION



License: SND-871 Docket: 70-903 Section: 200 Subsection/Subpart: 202

Subject: Figure 202-I -- Organization Chart, Nuclear & Industrial Safety Dept.

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NUCLEAR FUELS CORPORATION

203. Nuclear Materials Management

The Nuclear Materials Management responsibilities, controls and operations are described in Section 500.

License: SNM-871 Docket: 70-903 Section: 200 Subsection/Subpart: 203

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Nuclear Materials Management

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NUCLEAR FUELS CORPORATION

204. Engineering Manufacturing Organizations

1. General Description

- 1.1 Gulf United Nuclear Fuels Corporation's manufacturing operations are organized for the specific purpose of chemical and ceramic processing SNM for further fabrication of fuel assemblies and actual fabrication of fuel assemblies. The organization chart, Figure 201-I, shows the subdivision of the engineering and manufacturing operations.
- 1.2 Each operation is headed by an Operation Manager who has full responsibility and authority to carry out the functions of that operation in conjunction with contributions of other departments or groups to achieve the overall objectives of the Corporation. Each Department Manager is directly responsible to his immediate superior for the conduct of his departmental affairs including implementation of disciplinary action against personnel failing to follow instructions. Further, each Department Manager has line responsibility to the members of his department.

2. Engineering and Manufacturing Departments

- 2.1 The processing covered by this license will be carried out under the direct responsibility of the respective Operation Manager. These managers have the responsibility for manufacture, engineering and shipment applicable to the production of products described in this application. The organization chart, Figure 204-I shows functions essential for the Manufacturing Operation.
- 2.2 The NIS Representative, Plutonium Operation will provide the onsite nuclear criticality safety, health physics, industrial safety and fire prevention, and medical services control functions for all engineering and manufacturing departments at both the Eastview and Pawling sites. This will provide a consistent health and safety program.

License: SNM-871 Docket: 70-923 Section: 200 Subsection/Subpart: 204

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Engineering and Manufacturing
Operations Organizations

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NUCLEAR FUELS CORPORATION

204. Engineering and Manufacturing Organizations

2. Engineering and Manufacturing Departments (continued)

- 2.3 Specific procedures are set up to insure that the proper quantities of uranium are present in the various products produced. Processing procedures are set up within the responsible department.

Management channels are established as the need for delegation of work arises. Changes at levels below the first line management level reporting to the head of a department are a management prerogative, and therefore, a detailed listing of the present supervisory levels is not provided except for the operating Nuclear and Industrial Safety group.

- 2.4 The Plutonium Operation is organized for the purpose of process development of plutonium and plutonium-uranium mixtures.
- 2.5 The Material Technology Laboratory is organized for the purpose of research and development of SNM materials. No unclad plutonium will be processed.
- 2.6 The Uranium Fuel Development Laboratory is organized for the purpose of research and development of uranium bearing materials in all chemical and physical forms.

License: SNM-B71 Docket: 70-903 Section: 200 Subsection/Subpart: 204

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Engineering and Manufacturing
Operations Organizations

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GULF UNITED

NUCLEAR FUELS CORPORATION

204. Engineering and Manufacturing Organization

3. Basic Responsibilities

3.1 Operation Manager

The Operation Manager is responsible for the safe efficient operation and maintenance of the plant in conformance with established policies and procedures for required administrative and process development work.

3.2 First Line Management

First Line Management reporting to the Plant Manager are responsible for the safe efficient operation of their assigned portions of the facilities. This includes the supervision of any activities assigned to them.

4. Personnel Qualifications

The minimum qualifications of the Operation Manager, and first line management shall be a B.S. degree in a technical field with two years experience in Nuclear plants and laboratories, or high school with ten years nuclear industry experience.

Resumes of the qualifications of the personnel performing these functions are included as back-up information.

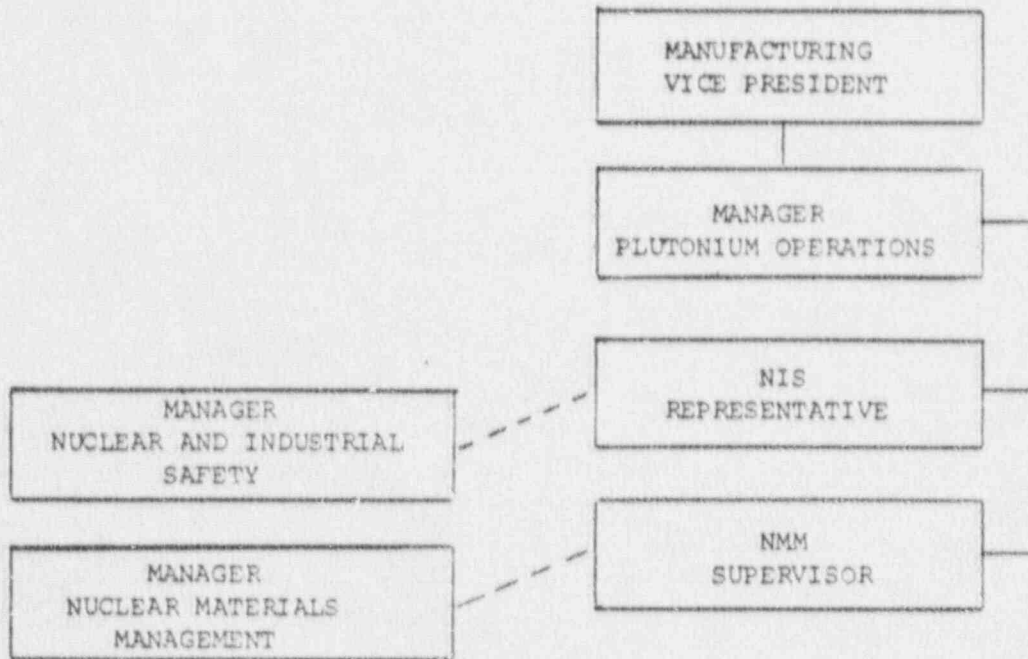
License: SNM-871 Docket: 70-903 Section: 200 Subsection/Support: 204

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Engineering and Manufacturing
Operations Organizations.

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NUCLEAR FUELS CORPORATION



License: SNN-871 Docket: 70-903 Section: 200 Subsection/Subpart: 204

Subject: Figure 204-1 -- Organization Chart, Plutonium Operation

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NUCLEAR FUELS CORPORATION

205. Operating Policies and Procedures

Corporate Policy requires that supervision at all levels assure themselves that all handling, processing, storing and shipping of SNM, is given prior review and approval by the Nuclear and Industrial Safety Department, that suitable control measures are prescribed, and that all pertinent regulations, control procedures relative to nuclear criticality safety or radiological safety, are followed by supervision and all operating personnel.

Approval by the Nuclear and Industrial Safety Department shall be in accordance with criteria established by the license. The mechanism of such approval is described in more detail in Subsection 206.

It is the policy to avoid any tendency for procedures and practice to be at variance. To this end, there exists a system for rapid consideration of suggested changes in procedures followed by swift implementation of those approved. Personnel are required to await issuance of an updated procedure and not to violate outmoded procedures for the sake of expediency.

License: SNM-871 Docket: 70-903 Section: 200 Subsection/Subpart: 205

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Operating Policies and Procedures

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GULF UNITED

NUCLEAR FUELS CORPORATION

206. Nuclear and Industrial Safety Control

1. Responsibility

On-site nuclear and industrial safety control is exercised by Operating Supervision with overchecks performed by Scientists, Engineers and the Nuclear and the Industrial Safety Representative. Operating Supervision must assure that nuclear criticality safety and health physics control procedures are followed as defined by approved operating procedures or posted control limits.

2. Nuclear and Industrial Safety Department Approval

NIS Department approval on equipment and operating procedures is identified by signature of the NIS Department Representative on the operating procedures and/or criticality signs. This approval shall only be granted when:

2.1 Nuclear criticality safety evaluation has been performed by NIS Representative based on the criteria and standards of Sections 300 and 400.

2.2 The NIS Representative's evaluation has been reviewed by two Nuclear Safety Specialists. This review is based on the criteria and standards of Section 300 and includes verification of each of the following:

1. assumptions
2. correct application of criteria of Section 300
3. completeness and accuracy of the evaluation
4. familiarity of the installation

2.3 The NIS Representative's evaluation has been reviewed by a Health Physics Specialist. This review is based on the criteria and standards of Section 400.

2.4 Review and verification shall include written approval by the reviewers.

2.5 All evaluations, reviews and verifications have been overchecked by the Nuclear and Industrial Safety Manager. This overcheck will be indicated by written approval.

License: SNM-871 Docket: 70-903 Section: 200 Subsection/Subpart: 206

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Nuclear and Industrial Safety Control

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NUCLEAR FUELS CORPORATION

206. Nuclear and Industrial Safety Control

3. Records

Records of NIS evaluations and approvals will be maintained for a period of at least six (6) months after use of the operation has been terminated.

4. Suspension of Operations

Primary responsibility and authority to suspend unsafe operations is placed with Operating Supervision. Within their respective responsibilities the members of the Nuclear and Industrial Safety Department also have authority to suspend operations not being performed in accordance with approved procedures.

License: SNT-871 Docket: 70-903 Section: 200 Subsection/Subpart: 206

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Nuclear and Industrial Safety Control

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GULF UNITED

NUCLEAR FUELS CORPORATION

207. Inspections and Audits

1. General

A continuous re-appraisal of the safety program is provided through a system of daily checks, regular inspections, and audits. Health physics personnel, thoroughly familiar with regular operations, make daily checks to determine that there has been no change in the parameters or conditions of operations, that may affect the safety of these operations. A planned schedule of regular inspections is established by the Department Manager. Infractions and violations are corrected on the spot with the concurrence of the cognizant Specialist and/or Manager of Industrial Safety. Results of inspections and audits are included in the department monthly report.

2. Daily Checks

Daily checks and visits are observations made routinely by Health Physics Technicians who observe, note, and make general observations in addition to their radiation survey functions.

3. Inspections

Inspections are performed by NIS Department Representatives (nonresident), Specialist or NIS Manager. An inspection includes a review of checks to determine the area or areas requiring more detailed observation. Generally, a specific area will be observed for a sufficient time to indicate corrective action if needed. Inspections are documented and maintained as a record for at least one year. These inspections will be performed as follows:

<u>Function</u>	<u>Minimum Frequency</u>
Health Physics	2 months
Nuclear Criticality Safety	2 months

The minimum frequency is increased when new operations are in the startup phase.

License: SNM-871 Docket: 70-903 Section: 200 Subsection/Subpart: 207

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Inspections and Audits

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GULF UNITED

NUCLEAR FUELS CORPORATION

208. Training

1. Purpose

The purpose of the training program is to inform and instruct all employees in the policy and programs of the company as they relate to nuclear criticality safety, health physics and industrial safety, and proper and safe performance of their assignments.

2. New Employees

The indoctrination of new employees in the safety aspects of the facility is conducted by, or under the supervision of specialist in the various topics. The indoctrination topics include but are not limited to:

- a) Fundamentals of nuclear criticality safety and controls.
- b) Fundamentals of the health physics program and controls.
- c) Emergency alarms and actions required.
- d) A review of the facility operations.
- e) On the job training, under direct line supervision and/or by experienced personnel.

3. Continued Training

The training and personnel safety program is continued with on the job training supplemented by regularly scheduled meetings conducted by line supervision and specialist in the subjects covered. Included are personnel protection, equipment, industrial safety and accident prevention and other topics applicable to the facility operations.

License: 400-871 Docket: 70-903 Section: 200 Subsection/Subpart: 208

Subject: ORGANIZATION, PERSONNEL AND ADMINISTRATION - Training

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GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION President

PERSON Arnold R. Fritsch

EXPERIENCE

Dr. Fritsch has over fifteen years experience throughout the nuclear industry. Assignments have included policy formulation and consultation to the Chairman of the U.S. Atomic Energy Commission; coordination of all fuel reprocessing and materials control and management; and establishing, staffing and planning of a spent fuel reprocessing company. He has also had extensive experience in long range studies of reactor programs.

FORMER POSITIONS

1970 - 1971 Coordinator - Allied Gulf Nuclear Services, Gulf Energy and Environmental Systems

1968 - 1970 Manager, Program Evaluation and Sr. Advisor to Group Vice Presidents, Gulf Energy and Environmental Systems

1961 - 1968 Technical Assistant and Special Assistant to the Chairman, U.S. Atomic Energy Commission

1959 - 1961 Division of International Affairs, U.S. Atomic Energy Commission

1956 - 1959 Senior Engineer, Nuclear Physics, Westinghouse Atomic Power Division

EDUCATION

B.S. Physical Chemistry, University of Rochester, 1953

Ph.D Physical Chemistry, University of California at Berkeley, 1956

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION Vice President, Finance and Administration

PERSON Kenneth L. Wiley

EXPERIENCE

Mr. Wiley has over twenty-two years experience in a variety of administrative positions throughout a major energy company. Assignments have included all levels of accounting and financial control for production and mining operations. He also has had extensive administrative and managerial experience within various operating divisions.

FORMER POSITIONS

1969 - 1971	Manager, Finance and Services, Gulf Mineral Resources Division, Gulf Oil Corporation
1967 - 1969	Division Accountant, Gulf Mineral Resources Division, Gulf Oil Corporation
1964 - 1967	Area Accounting Supervisor, Gulf Oil Corporation
1961 - 1967	Senior Unit Accounting Supervisor, Gulf Oil Corporation
1956 - 1960	Unit Accounting Supervisor, Gulf Oil Corporation
1954 - 1956	Group Accounting Supervisor, Gulf Oil Corporation
1953 - 1954	Assistant Area Accounting Supervisor, Gulf Oil Corporation
1948 - 1953	Various Accounting Positions, Gulf Oil Corporation

EDUCATION

B.S.	Business Management, Oklahoma State University, 1948
	Graduate Studies Leading to MBA, Finance, University of Colorado

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION Vice President, Manufacturing Operations

PERSON Frederick G. Stengel

EXPERIENCE

Mr. Stengel has over eighteen years experience in development and fabrication of nuclear core fuel materials, fuel elements, and assemblies. His developmental experience includes several prototype naval reactors, PWR and HTGR. He has extensive background in the development of uranium alloy, carbide, and in management of related technical programs.

FORMER POSITIONS

1967 - 1971 General Manager, United Nuclear Corporation, Commercial Products Division

1965 - 1967 Chemical Operations Manager, United Nuclear Corporation, Fuels Division

1963 - 1965 Manager, Process Engineering, General Atomic, Fuel Operations Division

1958 - 1963 Supervisor, Westinghouse Electric Corporation, Bettis Atomic Power Division

1952 - 1958 Junior to Senior Engineer, Westinghouse Electric Corporation, Bettis Atomic Power Division

EDUCATION

B.S. Metallurgical Engineering, Massachusetts Institute of Technology, 1952

B.A. University of Pittsburgh, 1959

GULF LIMITED
NUCLEAR FUELS CORPORATION

POSITION Vice President, Utility Fuel Engineering

PERSON Richard A. Dean

EXPERIENCE

Dr. Dean has over 13 years experience in the design and development of fuel rods, fuel assemblies and core internals, including the thermal and hydraulic design of commercial LWR's and most recently, total responsibility for a company sponsored utility fuel development program.

FORMER POSITIONS

1970 - 1971 Technical Director, LWR Fuel Division, Gulf General
Atomics Corp., LaJolla, California

1966 - 1970 Nuclear Energy Systems Manager, Westinghouse Electric Corp.

1959 - 1966 Junior to Senior Engineer, Westinghouse Atomic Power Division,
Westinghouse Electric Corp.

EDUCATION

B.S. Mechanical Engineering, Georgia Institute of Technology, 1957

M.S. Mechanical Engineering, University of Pennsylvania, 1963

PhD Mechanical Engineering, University of Pennsylvania, 1970

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GE-UNITED
NUCLEAR FUELS CORPORATION

POSITION Nuclear and Industrial Safety Representative,
Plutonium Operations

PERSON Harold E. Clow, Jr.

EXPERIENCE

Mr. Clow has over sixteen years experience in health physics, industrial hygiene and safety, nuclear criticality safety and nuclear materials management. He has had practical experience in fuel production facilities, research and development laboratories and operating reactors.

This background covers preparing operating and auditing manuals and procedures for all phases of health and safety control as well as responsibilities for supervision of health physics for a major site including four operating reactors, a Hot Lab and a major waste disposal facility. Assignments have included membership on a radiological emergency re-entry team, field assignment to an operating reactor and auditing for health physics, nuclear criticality safety and nuclear materials management.

FORMER POSITIONS

1971 - Present	Associate Health Physist - Nuclear Materials Management, Atomics International
1967 - 1971	Associate Health Physist - Criticality Safeguards Staff, Atomics International
1959 - 1967	Associate Health Physist - Health, Safety and Radiation Services, Atomics International
1957 - 1959	Junior Health Physics Engineer - Bettis Atomic Power Laboratory
1956 - 1957	Health Physics Technician - Bettis Atomic Power Laboratory

EDUCATION

Science and Engineering	Pittsburgh Technical Institute (Junior College) 1955-1956.
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GULF LIMITED

NUCLEAR FUELS CORPORATION

POSITION Vice President, Marketing

PERSON Leo Macklin

EXPERIENCE

Mr. Macklin has over 25 years experience in the nuclear industry including knowledge of utility power plant planning, design and operation, and sales/marketing management of nuclear component equipment and light water reactor fuel elements. He has negotiated contracts with government agencies as well as held total responsibility for sales promotions and marketing strategies.

FORMER POSITIONS

1969 - 1971 Vice President, Utility Marketing, United Nuclear Corporation, Commercial Products Division

1963 - 1969 Manager of Utility and International Marketing, United Nuclear Corp.

1958 - 1963 Manager of Civilian Applications, Nuclear Development Associates

1955 - 1958 Manager, Nuclear Power Sales, Combustion Engineering Corp.

1947 - 1955 Project Engineer, Ebasco Services Inc.

1946 - 1947 Mechanical Engineer, West Virginia Pulp & Paper Company

1943 - 1946 U. S. Navy

1941 - 1943 Mechanical Engineer, Foster Wheeler Corp.

EDUCATION

B.M.E. College of the City of New York, 1942

M.M.E. Polytechnic Institute of Brooklyn, 1949

Post Grad. Columbia University, Nuclear & Mechanical Engineering

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GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION General Manager, Gulf United Services

PERSON William J. Manion

EXPERIENCE

Mr. Manion has nineteen years experience in the nuclear industry in various technical and management assignments. Responsibilities have included project management for utility reactor reload fuel contracts, engineering support for operating reactor plants, and design of reactor control systems.

FORMER POSITIONS

1972 - Present	General Manager, Gulf United Services
1970 - 1972	Project Manager, Gulf United (formerly United Nuclear, REC)
1963 - 1970	United Nuclear Corporation
	1967 - 1970 Manager of Technical Support Services
	1963 - 1967 Manager of Systems Engineering Department
1956 - 1962	Combustion Engineering, Inc., Naval Reactors Division
	1960 - 1962 Operations Manager
	1959 - 1960 Field Office Manager, Electric Boat Shipyard
	1958 - 1959 SIC Test Manager
	1956 - 1958 Assistant Power Plant Manager
1954 - 1956	Plant Manager, New Jersey Bell Telephone Co.
1952 - 1954	U.S. Army Signal Corps, First Lieutenant

EDUCATION

B.M.E. Massachusetts Institute of Technology, 1952

All course work completed toward M.S. degree in Engineering Management, Rensselaer Polytechnic Institute and Newark College of Engineering.

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION Regulatory Administration Manager

PERSON Peter Loysen

EXPERIENCE

Mr. Loysen has over eighteen years of comprehensive experience in radiation protection. His experience includes six years of Health and Safety Program direction in nuclear fuel and large isotopic source operations and six years of occupational and environmental health surveillance of AEC contractor facilities. In addition, he has four years of experience preparing and reviewing criticality evaluations and auditing nuclear safety programs. Mr. Loysen served on the committee that prepared the American Standard, Radiation Protection in Nuclear Fuel Fabrication Plants.

FORMER POSITIONS

1971 - 1972	Nuclear & Industrial Safety Manager, Gulf United Nuclear Fuels Corporation
1970 - 1971	Nuclear & Industrial Safety Manager, United Nuclear Corporation, Commercial Products Division
1968 - 1970	Radiation Counsel, Radiation Machinery Corporation
1961 - 1968	Assistant to the Director, Health Protection Engineering Division, U.S. Atomic Energy Commission
1956 - 1961	Health and Safety Director, Metals and Controls Division, Texas Instruments, Incorporated
1952 - 1956	Industrial Hygienist, U.S. Atomic Energy Commission

EDUCATION

B.ChE.	Rensselaer Polytechnic Institute, Troy, New York, 1952
	Harvard University School of Public Health, Industrial Air Analysis, 1954
	Oak Ridge National Laboratory, Nuclear Safety Training Course, 1957
	Commonwealth of Massachusetts, Civil Defense Training Course, 1960

LICENSE

Certified Health Physicist, No. 62-97

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GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION Licensing Manager

PERSON Robert E. Kropp

EXPERIENCE

Mr. Kropp has over nineteen years experience in nuclear safety, reactor hazards analysis, reactor physics and reactor design. His experience covers the design, fabrication and operation of Swimming Pool, Pressurized Water and High Temperature Gas Cooled Reactors. He has extensive background in directing nuclear safety programs, preparing manuals and procedures for criticality control and reactor operations and preparing computer programs for health and safety analysis. Mr. Kropp serves on the American National Standards Institute committee on Transportation of Radioactive Materials.

FORMER POSITIONS

1971-1972	Nuclear Safety Specialist, Gulf United Nuclear Fuels Corporation
1968-1971	Nuclear Safety Specialist, United Nuclear Corporation, Commercial Products Division
1965-1968	Nuclear Safety Specialist, Fuels Division, United Nuclear Corporation
1963-1965	Staff Associate, Nuclear Analysis and Reactor Physics Department and Member, Criticality Safeguard Committee, John J. Hopkins Laboratory for Pure and Applied Sciences, General Atomic
1958-1963	Lead Engineer, Criticality Control Standards, Bettis Atomic Power Laboratory, Westinghouse Electric Corporation
1956-1957	Test Engineer, Reactor Operations and Hazards Group, Convair, Fort Worth Division
1952-1956	Aerological and Research Officer, U.S. Navy
1951-1952	Meteorological Aid, U.S. Weather Bureau

EDUCATION

B.S.	Meteorology, Florida State University, 1951
	Graduate Physics, University of California, 1954-1955
	Graduate Physics, Texas Christian University, 1956-1957
	Bettis School of Reactor Engineering, 1958-1961
M.B.A.	General Management, University of New Haven, 1971

LICENSE

Certified Safety Professional, No. 2683
U. S. Atomic Energy Commission Operator License, OP-1800, 1964 (Not active)

Issued: 1/10/73

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION Health Physics Specialist and Nuclear and Industrial Safety Representative, Chemical Operations

PERSON David G. Darr

EXPERIENCE

Mr. Darr has over eighteen years experience in Health Physics involving source and special nuclear materials, by-product materials, x-ray equipment and particle accelerators. His background includes planning and administering Health Physics programs, preparing manuals and procedures for Health Physics controls, equipment and facility design, and environmental sampling and evaluation.

He has four years experience in nuclear safety involving audit functions for both reactor component fabrication and special nuclear materials processing. One year of this experience included performing basic nuclear safety evaluations and reviewing and preparing manuals and procedures for criticality control. Mr. Darr has completed the Gulf United Nuclear Criticality Safety Training Program.

FORMER POSITIONS

1968 - 1971	Health Physics Specialist, United Nuclear Corporation, Commercial Products Division
1967 - 1968	Nuclear Licensing and Safety Specialist, United Nuclear Corporation, Fuels Division
1964 - 1967	Health Physics and Safety Supervisor, United Nuclear Corporation, Fuels Division
1961 - 1964	Health Physics Officer, Member of Isotope Committee and Consulting Industrial Physicist, Nuclear Consultants Corporation
1957 - 1961	Health Physics Supervisor, Nuclear Fuels Operation, Olin Mathieson Chemical Corporation
1956 - 1957	Technician, Health Physics Department, Uranium Division, Mallinckrodt Chemical Works
1954 - 1956	NCOIC, Operations Group, 1st Radiological Safety Support Unit, U.S. Army, Nevada Test Site and Ft. McClellan, Alabama

EDUCATION

Engineering	Central Missouri State College, 1953
Engineering	Washington University, 1957
Physics	New Haven College, 1960

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION

Health Physics Specialist and Nuclear and Industrial Safety Representative, Fabrication Operations

PERSON

Ronald C. Kish

EXPERIENCE

Mr. Kish has over sixteen years of experience in health physics, industrial hygiene and safety. He has had practical experience in fuel production facilities, X-ray and accelerator installations, critical reactor test and power facilities, environmental assessment, and hot laboratory operations during both normal as well as two separate expansion phases. This involved source and special nuclear materials, by-product materials, radiation generating equipment, and noxious chemicals.

This background includes preparing and auditing manuals and procedures connected with the health physics, industrial hygiene, and safety programs of facilities and equipment. (He has also been involved with the auditing the health physics and safety aspects of a major modification of a commercial atomic power plant.) Most recently his concern was the environmental sampling and assessment of both a power plant as well as a major governmental installation.

FORMER POSITIONS

1965 - 1972	Health Physics Engineer, Bettis Atomic Power Laboratory
1964 - 1965	Radiation and Safety Engineer, assigned to Shippingport Atomic Power Station
1956 - 1964	Radiation Hygiene Engineer, Bettis Atomic Power Laboratory
1956	Radiation Hygiene Engineer, Westinghouse Electric Corporation, Blairsville Atomic Fuel Department.

EDUCATION

B.S.	Physics, University of Pittsburgh, 1953
Grad. Study	Med. line, University of Pittsburgh, 1953 - 1954
Grad. Study	Radiation Biology, University of Rochester, 1954 - 1955

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GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION

Consultant, Nuclear Criticality Safety
(Physicist, Engineering Operation)

PERSON

James H. Ray

EXPERIENCE

Mr. Ray has over twenty-two years experience in reactor analysis, nuclear data evaluation and compilation, radiation shielding, and criticality safety. His background also includes heat transfer, fluid flow measurement, temperature measurement, high pressure measurement, combustion equilibrium calculation, and radio-frequency noise measurement and reduction.

FORMER POSITIONS

1968 - 1971	Physicist, Research and Engineering Center United Nuclear Corporation
1962 - 1968	Physicist, Physics and Mathematics Department, United Nuclear Corporation
1957 - 1962	Physicist, Physics and Mathematics Department, Nuclear Development Corporation of America
1955 - 1957	Physicist, Physics and Mathematics Department, Nuclear Development Associates
1954 - 1955	Physicist, Philips Laboratories Division, North American Philips Company
1952 - 1954	Engineer, Electro-Search Company (Summers only)
1947 - 1951	Physicist, Reaction Motors, Inc.

EDUCATION

A.B.	Physics, Harvard University, 1947
M.S.	Physics, University of Pennsylvania, 1954

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION

Manager, Plutonium Operations

PERSON

James C. Andersen

EXPERIENCE

Mr. Andersen has over twenty-five years experience in research and development of nuclear fuels. Responsibilities have included process development equipment design and program supervision for nuclear fuel fabrication facilities.

FORMER POSITIONS

1966 - Present	Gulf United (formerly United Nuclear, REC)
1966 - 1972	Manager, Fabrication Section, Plutonium Fuels Department
1972 - Present	Manager, Plutonium Operations
1944 - 1966	Senior Project Engineer, Nuclear Fuels Department, Carborundum Company

EDUCATION

Dewey University, Manila, 1945 - 1946
University of Buffalo, 1951 - 1964

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION

Manager, Materials Technology Laboratory

PERSON

George Stern

EXPERIENCE

Mr. Stern has over thirty years total experience in materials research and metallurgy of which the past fifteen years have been in the area of nuclear fuels research and development. Responsibilities have included fuel and materials selection criteria for reactor cores, liquid metal, analytical techniques and process specifications for heat treating, welding, brazing, and corrosion testing.

FORMER POSITIONS

1958 - Present	Manager, Materials Technology Department, Gulf United (formerly United Nuclear, REC)
1955 - 1958	Technical Director, American Sinteel Corporation
1944 - 1955	Technical Director, American Electro Metal Corporation
1941 - 1944	Associate Metallurgist, Armour Research Foundation
1940 - 1941	Metallurgist, American Electro Metal Corporation
1939 - 1940	Metallurgist, New York Testing Laboratories

EDUCATION

B.Ch.E.	College of the City of New York, 1937
M.S.	University of Michigan, 1939 (Metallurgical and Chemical Engineering)

ISSUED: 1/19/73

GULF UNITED
NUCLEAR FUELS CORPORATION

POSITION: Manager, Physics and Mathematics Department (Member, Nuclear Criticality Safety Computer Calculation Review Committee)

PERSON: Robert D. Schamberger

EXPERIENCE

Dr. Schamberger has more than twenty-one years of broad experience in the direction and performance of nuclear physics analyses, and in radiation transport phenomena and nuclear reactor shielding. He is the author of a number of publications in the scientific literature dealing with these subjects.

FORMER POSITIONS

1958 - 1971 Manager, Physics and Mathematics Department, United Nuclear Corporation, Research and Engineering Center

1956 - 1958 Supervisory Physicist, Wright Air Development Center, Aeronautical Laboratory

1951 - 1956 Associate Physicist, Brookhaven National Laboratory

EDUCATION

B.S. Union College, Physics, 1944

Ph.D. University of Rochester, Physics, 1951

Issued: 1/19/73