

ANNUAL REPORT FOR 1983 FOR THE
UNION CARBIDE NUCLEAR REACTOR (UCNR)
DOCKET 50-54, LICENSE R-81

A. FACILITY MODIFICATIONS AND LICENSE CHANGES

1. One silver indium cadmium control rod was replaced. Installation of this rod completes the transition to new control rods incorporating a thicker tin-nickel surface plating and a strengthened rod to piston connection.
2. The 6 inch line between the primary system and the 100,000 gallon storage tank was replaced.
3. The Physical Security Plan entitled "Physical Security Plan for the Union Carbide Corporation Facility at Tuxedo, New York" was approved by the NRC and incorporated into the R-81 License (Amendment 20).
4. The R-81 License was amended (Amendment 19) to allow reactor startup with two normal power level channels.

B. PROCEDURES MANUAL

The following is a listing of the major changes to the Facilities Procedures Manual.

- DS-02 Control and Safety Setpoints - Data changed to show period scram alarm to be audible as well as visual.
- RM-03 Reactor Start Up - Required startup channels changed to reflect Tech Specs Amendment requiring only two normal power level channels.
- RM-04 Reactor Operation - New procedure added for single pull FPM stringer target transfers.
- RM-09 Reactor Components - New Procedure added for use of external rod magnet power supply designed for reactor maintenance during shutdown periods.
- RM-12 TI Sump - New Procedure describing Bldg. 2 ground water collection system and required responses to alarms.
- RS-01 Reactor Console Checklist - Additional channel checks included in checklist.
- RS-03 Electronic Equipment Test List - Additional startup channel checks added and readability improved.

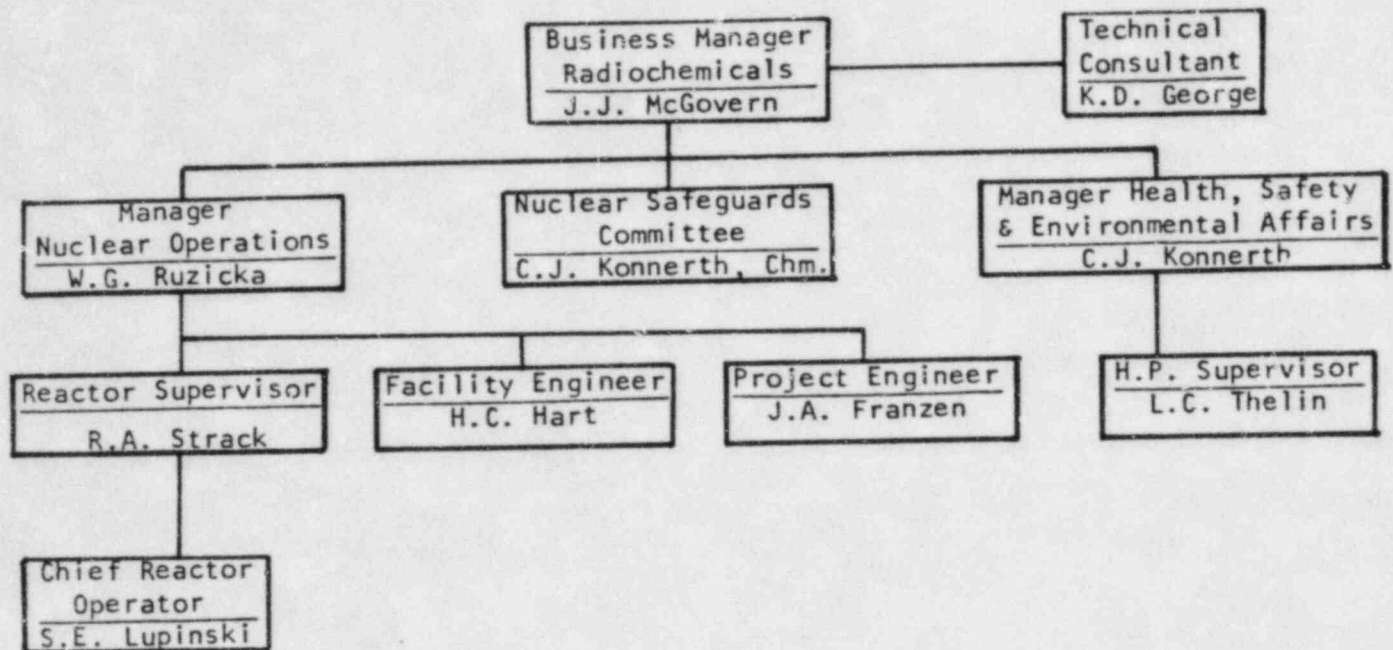
A42P

PROCEDURES MANUAL (CONTINUED)

- RS-04 Reactivity and Core Checklist - Changed to reflect rearranged sample irradiation positions.
- RS-06 Reactor Restart Checklist - Modified to include required monthly channel checks.
- RS-11 Daily Checklist - Contaminated waste water storage tank level check added.
- RS-14 Power Data Sheet - Log N Period, Count rate channel and core exit temperature checks added.
- RS-31 Charcoal Filter Efficiency Checks - Procedure changed to include more detail.
- RS-33 Control Rod Calibration - Rod drop calibration modified to allow calibrations regardless of previous reactor operating history.
- RS-37 Fission Chamber Calibration - Modified to include calibration requirements on spare fission chambers.
- RS-39 Flow Meter Calibration - Frequency of test included on calibration sheet.
- RS-44 Rod Scram Time Measurements - Maximum magnet release time added and definition of scram time clarified.
- RS-47 Bridge Excursion monitor calibration - Procedure modified to allow calibration with a new type NBS radiation source or its equivalent.
- RS-48 TI Sump Check - New procedure for testing Bldg. 2 ground water collection alarm system.
- RS-49 Evacuation Horn Test - New Procedure for functional testing of Bldg. 1 and Bldg. 2 evacuation horns.
- EP-01 General - Additions and changes to data on emergency roster telephone listing.
- EP-14 Access Control to Buildings 1 & 2 - Additions and changes in individuals authorized access to "controlled access area".

C. ORGANIZATIONAL CHANGES

The following is the Union Carbide Corporation Reactor Administration Organization:



D. SUMMARY OF UNSCHEDULED SHUTDOWNS

The following is a listing of unscheduled shutdowns occurring during 1983.

Type of Shutdown	Number	Cause
Power Outage	14	Commercial Power Failure
False Signal	8	Log N
	2	Safety Amplifier
	1	Simultaneous Manual Scram & Pump Failure Scram
	3	Momentary Loss of Magnet Current
Equipment Failure Causing Automatic Shutdown	7	Rod Magnet Failure
	4	Loss of Magnet Current
	1	UIC Failure
	2	Safety Amplifier

SUMMARY OF UNSCHEDULED SHUTDOWNS (CONTINUED)

Automatic Safety Action Initiated - Operator Error	2	Core exit flapper opened above allowed power setpoint causing automatic scram.
	1	Log N period scram during sample movement due to shadowing.
Operator Initiated Manual Shutdown	2	In core FPM target failure
	1	Console relay shorted from spilled liquid.
	1	Received Area radiation and stack alarms.
	1	Chemical reaction in stored peroxide creating steam in pump room.
	1	Loss of building high pressure air.
	1	Loss of area radiation alarm system power supply.
	1	Replacement of noisy pump failure relay.
	1	Loss of Hot Lab exhaust fan.

E. POWER GENERATED

Total power generated in 1983 was 41,011 megawatt hours. The reactor was operated on a seven day a week schedule with refueling and maintenance shutdowns about once every one or two weeks.

F. ROUTINE TESTS CONDUCTED

The reactor surveillance program has revealed no significant nor unexpected trends in reactor systems performance during the past year with tests yielding routine results.

G. FUEL

17 standard and 4 control fuel elements, containing aluminide (U-Al_x) fuel matrix manufactured by CERCA (France), were received by Union Carbide Nuclear Reactor in 1983. Twenty-four spent fuel elements were shipped to Idaho for reprocessing.

H. PERSONNEL RADIATION EXPOSURES

Sixteen members of the Reactor Operations Staff and two members of the Health Physics Staff received exposures in excess of 25% of the recommended limit in 1983. These doses ranged from 1.26 rem to 3.93 rem with the overall average for these individuals being 2.44 rem.

A part of this exposure was due to maintenance support for Hot Laboratory Operations which is licensed under New York State Radioactive Materials License 729-0322.

No visitors to the facility received exposures greater than 25% of that permitted.

I. OFFSITE RELEASES OF RADIATION

1. Radioactivity released in Air Effluent from the site.

a. Noble Gases

<u>Isotope</u>	<u>Quantity Released (Curies)</u>
Kr-83m	327.9
Kr-85m	962.0
Kr-87	87.4
Kr-88	1246.4
Xe-133m	327.9
Xe-133	10670.6
Xe-135m	2186.6
Xe-135	6055.9
Kr-85	1.3

Total Noble Gas Release 21866 Ci

Average Concentration of Noble Gases in Stack 2.9×10^{-5} uCi/cc

b. Iodines

<u>Isotope</u>	<u>Quantity Released (Curies)</u>
I-125	1.41 Ci
I-131	3.17 Ci

Average Concentration in Stack

I-125	1.90×10^{-9} uCi/cc
I-131	4.28×10^{-9} uCi/cc

2. Radioactivity released in Liquid Effluent from the site.

Gross Beta Activity 0.0005 Ci (Sr-90 Equivalent)

3. Particulate radioactivity released from the site.

The average concentration of particulate radioactivity released during 1983 was 6.29×10^{-12} uCi/cc. This activity consisted of the following approximate isotopic breakdown.

<u>Particulate Isotope</u>	<u>Percent of Total Activity</u>
^{136}Cs	1.5
^{103}Ru	41.2
^{137}Cs	8.6
^{95}Zr	34.2
^{95}Nb	14.5

4. Calculated doses to a critical individual in the unrestricted area.

- a. From releases of iodine during 1983

Dose via infant inhalation at Laurel Ridge

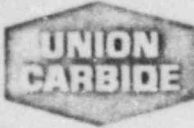
0.43 mrem from Iodine-131

0.15 mrem from Iodine-125

- b. From releases of noble gas during 1983

1.00 mrem total body dose at Laurel Ridge which is nearest residential area

For all site effluent releases approximately 95% result from Hot Laboratory operations under NYS License 729-0322.



UNION CARBIDE CORPORATION
MEDICAL PRODUCTS DIVISION

P. O. BOX 324, TUXEDO, NEW YORK 10987
TELEPHONE NUMBER: (914) 351-2131

March 20, 1984

U. S. Nuclear Regulatory Commission
Director, Division of Project
and Resident Programs
King of Prussia, Pa 19406

Att: Mr. Richard W. Starostecki

Subject: Annual Report: Docket 50-54 License R-81

Dear Mr. Starostecki:

The following Annual Operating Summary for Union Carbide's
Sterling Forest Reactor for the year 1983 is herewith submitted.

Sincerely,

Robert A. Strack
Reactor Supervisor

RAS:ltm
Enclosure

cc: U.S. Nuclear Regulatory Commission
Director
Office of Nuclear Reactor Regulation
Division of Licensing
Washington, D. C. 20555

U.S. Nuclear Regulatory Commission
Director
Office of Inspection & Enforcement
Washington, D. C. 20555

American Nuclear Insurers
270 Farmington Avenue
Farmington, Ct 06032

A020
1/1