



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PDR-016

JUL 14 1985

Steve Kohn, Esquire
Mr. Richard Condit
Government Accountability Project
1555 Connecticut Avenue, NW, Suite 202
Washington, DC 20036

IN RESPONSE REFER TO:
FOIA-85-256, FOIA-85-258,
FOIA-85-259, FOIA-85-261

Dear Messrs. Kohn and Condit:

This is in further response to your letters of April 9, 1985, in which you requested, pursuant to the Freedom of Information Act (FOIA), various categories of documents relating to Dow Chemical Company of Midland, Michigan.

The enclosed Appendices H, I, J, and K list additional documents subject to requests FOIA-85-259 and FOIA-85-261. These will be placed in the NRC Public Document Room (PDR) in a folder under your names with the FOIA numbers listed above.

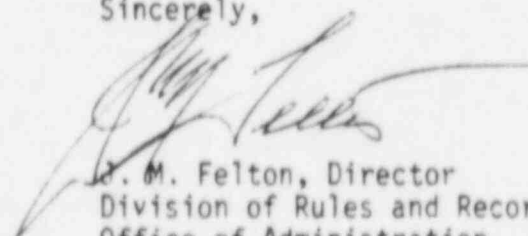
Portions of Document I-10, listed in Appendix I, are being withheld from disclosure pursuant to Exemption (6) of the FOIA (5 U.S.C. 552(b)(6)) and 10 CFR 9.5(a)(6) of the Commission's regulations. The information withheld consists of birthdates, home addresses, and other personal information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Pursuant to 10 CFR 9.9 of the NRC's regulations, it has been determined that the information withheld is exempt from production or disclosure, and that its production or disclosure is contrary to the public interest. The persons responsible for the denial of the information are the undersigned and Mr. James G. Keppler, Administrator of NRC's Region III.

This denial may be appealed to the NRC's Executive Director for Operations within 30 days from the receipt of this letter. As provided in 10 CFR 9.11, any such appeal must be in writing, addressed to the Executive Director for Operations, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and should clearly state on the envelope and in the letter that it is an "Appeal from an Initial FOIA Decision."

Additional documents subject to FOIA-85-259 and FOIA-85-261 are still undergoing review.

Sincerely,


J. M. Felton, Director
Division of Rules and Records
Office of Administration

Enclosures: As stated

B508270276 B50712
PDR FOIA
KOHNB5-256 PDR

MAY 11 1979

Docket No. 50-264

Dow Chemical U.S.A.
ATTN: Dr. R. R. Langner
Radiation Safety Committee
1603 Building
Midland, MI 48640

Gentlemen:

This Information Notice is provided as an early notification of a possibly significant matter. It is expected that recipients will review the information for possible applicability to their facilities. No specific action or response is requested at this time. If further NRC evaluations so indicate, an IE Circular or Bulletin will be issued to recommend or request specific licensee actions. If you have any questions regarding this matter, please contact the Director of this office.

Sincerely,

James G. Keppler
Director

Enclosure: IE Information
Notice No. 79-12

cc w/encl:
Central Files
Director, NRR/DPM
Director, NRR/DOR
PDR
NSIC
TIC

J-35

OFFICE	RIII	RIII				
SURNAME	Heisman/bk	Keppler				
DATE	5/11/79					

~~1906190042~~ 1p.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

May 11, 1979

IE Information Notice No. 79-12

ATTEMPTED DAMAGE TO NEW FUEL ASSEMBLIES

This Notice provides information concerning the surreptitious introduction of a possibly damaging liquid into the new fuel storage pool at the Virginia Electric and Power Company, Surry Power Station in Surry County, Virginia.

On Monday, May 7, 1979, while conducting inspections of new fuel for Unit 2, the licensee found that plastic protective liners on 62 of 64 assemblies had been tampered with. Further inspection revealed that a white crystalline substance had been poured onto the assemblies. Preliminary analysis by VEPCO indicates that the substance is sodium hydroxide. The new fuel is stored in the Fuel Building, an area which is locked and alarmed, and to which access is controlled by the issuance of specially coded access cards. These cards are issued after the successful completion of a background screening program for both Virginia Electric and Power Company and contractor personnel.

The FBI is presently on-site conducting an extensive investigation. Westinghouse, the fuel vendor, is assisting in the evaluation of possible fuel damage.

This event could possibly provoke similar behavior on the part of other persons. Consequently, you should be aware of such an eventuality. At this time the NRC is not placing additional requirements on you, but is advising that extra caution be exercised in your existing security program.

This Information Notice is provided as an early notification of a possibly significant matter. It is expected that recipients will review the information for possible applicability of their facilities. No specific action or response is requested at this time. If further NRC evaluations so indicate, an IE Circular or Bulletin will be issued to recommend or request specific licensee actions. If you have questions regarding the matter, please contact the Director of the appropriate NRC Regional Office.

No written response to this Information Notice is required.

Enclosure: Listing of
IE Information Notices
Issued in 1979

~~79-12-000161-388~~

LISTING OF IE INFORMATION NOTICES
ISSUED IN 1979

Information Notice No.	Subject	Date Issued	Issued To
79-01	Bergen-Paterson Hydraulic Shock and Sway Arrestor	2/2/79	All power reactor facilities with an OL or a CP
79-02	Attempted Extortion - Low Enriched Uranium	2/2/79	All Fuel Facilities
79-03	Limitorque Valve Geared Limit Switch Lubricant	2/9/79	All power reactor facilities with an OL or a CP
79-04	Degradation of Engineered Safety Features	2/16/79	All power reactor facilities with an OL or a CP
79-05	Use of Improper Materials in Safety-Related Components	3/21/79	All power reactor facilities with an OL or CP
79-06	Stress Analysis of Safety-Related Piping	3/23/79	All Holders of Reactor OL or CP
79-07	Rupture of Radwaste Tanks	3/26/79	All power reactor facilities with an OL or CP
79-08	Interconnection of Contaminated Systems with Service Air Systems Used As the Source of Breathing Air	3/28/79	All power reactor facilities with an OL and Pu Processing fuel facilities
79-09	Spill of Radioactively Contaminated Resin	3/30/79	All power reactor facilities with an OL
79-10	Nonconforming Pipe Support Struts	4/16/79	All power reactor facilities with CP

IE Information Notice
No. 79-12
May 11, 1979

LISTING OF IE INFORMATION NOTICES
ISSUED IN 1979

Information Notice No.	Subject	Date Issued	Issued To
79-11	Lower Reactor Vessel Head Insulation Support Problem	5/7/79	All Holders of Reactor OLS and CPs

YELLOW FILE COPY

MAY 18 1979

Docket No. 50-264

Dow Chemical U.S.A.
ATTN: Dr. R. R. Langner
Radiation Safety Committee
1603 Building
Midland, MI 48640

Gentlemen:

The enclosed IE Circular No. 79-08, is forwarded to you for information. If there are any questions related to the contents or intent of the Circular or its attachments, please contact this office.

Sincerely,

James G. Keppler
Director

Enclosure: IE Circular
No. 79-08

cc w/encl:
Central Files
Director, NRR/DPM
Director, NRR/DOR
PDR
NSIC
TIC

RIII RIII
[Signature] *[Signature]*
Heishman/blk Keppler

5/18/79

J-36

1p. ~~7900080134~~

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

May 18, 1979

IE Circular No. 79-08

ATTEMPTED EXTORTION - LOW ENRICHED URANIUM

Background

In January 1979, a temporary contractor employee who was working at the General Electric plant in Wilmington, North Carolina, allegedly entered the plant and removed a drum containing two 5-gallon cans of low enriched uranium from the facility with the intention of extorting money for the return of the material. The Federal Bureau of Investigation conducted an intensive investigation leading to the arrest of the employee on February 1, 1979. All material was recovered and returned to the plant.

Discussion

Based on preliminary information provided the NRC, the theft was allegedly carried out in the following manner:

On Friday, January 26, 1979, the subject worked the day shift. At 10:50 p.m. the same day he drove back to the plant and entered with the night shift. He showed his Florida driver's license at the entrance gate instead of his yellow contractor badge because it had a blue background similar to that on the picture badge which he thought was required to gain access to the area of the plant that he wanted to penetrate. He had allegedly gained access using his driver's license on previous occasions.

Once inside the plant, the subject would have been guided by gates and fences into a parking area had it not been for the fact that one gate had been removed to allow installation of truck scales. He proceeded down the unprotected road to an area adjacent to the building he wanted to enter.

After the subject entered the building through a personnel door, he proceeded to his normal working station which was the Chem Tech Lab and entered, using his own key. In the lab he picked up his protective clothing, a two wheel cart used to move 55 gallon drums and a container used to ship chemicals. The container could hold two 5-gallon cans. He then proceeded to a door leading up a stairwell into the radiation

controlled area. The door was normally locked even though not required by regulations; however, at this time it was slightly ajar due to malfunction of the locking mechanism. Once inside the door, the subject put on his protective clothing and proceeded up the stairs to the Blend Queue Area. He removed two 5-gallon cans of UO₂, carried them down the stairs and put them in the shipping container. He then removed his protective clothing and retraced his steps on to the Chem Tech Lab. Once back in the lab he opened one can and removed some of the material which he intended to use to effect his blackmail scheme. Using the 2 wheel cart, he transported the remaining material to his car and loaded it in his trunk. He retraced his steps and left the plant just before midnight on Friday, January 26. Procedures require anyone leaving the plant after midnight to sign out. He had been in the plant approximately one hour. He had come in with the incoming plant change and had left with the outgoing shift.

Conclusion

The G. E. Wilmington plant had an industrial security system in operation at the time of the incident. This theft was facilitated by a failure of this system. The failure to check the subjects identification badge closely enough to distinguish a Florida driver's license from a General Electric badge authorizing access other than normal working hours and the failure to protect a disabled remotely operated gate which would have denied automobile access to the immediate area where material was stored were significant factors in the success of this theft. A third contributing factor was access to the material through an emergency exit which was normally closed and locked against access to the area where the material was stored.

Although the circumstances surrounding the possible occurrence of an event similar to this will vary according to each licensee's operation and safeguards system, the attached summary of this event clearly demonstrates the interrelationships of minor problems that seem insignificant if taken alone, but when combined, can allow a loss to occur. It also emphasizes that the possibility of an insider threat against a licensed facility does exist.

This Circular is issued for your information.

No action is requested of you and no written response to this Circular is required. If you desire additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

Attachments:

1. Sanitized Summary of
GE Wilmington Incident
2. List of IE Circulars Issued
in the Last Twelve Months.

Sanitized Summary of G.E. Wilmington Incident

I. Summary

On Monday, January 29, 1979, at 11:45 a.m., Region II was notified by telephone by the General Manager of the Wilmington, North Carolina, General Electric Company plant, that an extortion letter and a sample of UO2 powder were found at his office door when he came to work about 8:00 a.m. The letter stated that the writer had in his possession two 5-gallon containers of UO2 powder which he had taken from the plant. The containers were identified in the letter by serial numbers and by the gross weight (approximately 145 pounds total). The letter further stated that enough UO2 had been removed from one of the containers to furnish samples to newspaper editors, senators, anti-nuclear group leaders and others if his demand for \$100,000 in cash was not met by Thursday, February 1. The writer further stated that after the samples had been delivered, if he had not received the money, one container of UO2 powder would be dispersed through one unnamed large American City. The UO2 powder from the second container would be dispersed through another large city if an additional \$100,000 in cash was not provided at that time.

The General Manager verified the authenticity of the container numbers and the fact that the containers were not in their assigned locations.

Region II advised the Office of Inspection and Enforcement, NRC, Headquarters, and the Atlanta office of the FBI. The Atlanta FBI turned the case over to the Charlotte, North Carolina FBI office.

The FBI assumed investigative jurisdiction on Monday, January 29. It was decided not to send NRC investigators to the plant at that time, but that the NRC would wait for further developments and concentrate on planning and related safety evaluations. On Tuesday, January 30, two Region II investigators, knowledgeable in accountability and health physics, were sent to the plant to furnish technical expertise in the areas of material control and accountability and health physics, and to review GE activities to determine how the event occurred, without interfering with the FBI investigation.

A temporary employee of a General Electric Company subcontractor was subsequently arrested by the FBI on 2/1/79.

The containers and all the SNM were recovered by the FBI and returned to GE.

II Conclusions

The special inspection disclosed that: (a) the material control and accountability system functioned as designed and identified the missing containers in accordance with regulatory requirements; (b) health physics procedures were followed in accordance with regulatory requirements; (c) normal industrial security procedures were followed; and (d) no items of noncompliance with regulatory requirements were identified.

IE Circular No. 79-08
May 18, 1979

LISTING OF IE CIRCULARS ISSUED IN
LAST TWELVE MONTHS

Circular No.	Subject	Date of Issue	Issued To
78-03	Packaging Greater Than Type A Quantities of Low Specific Activity Radioactive Material for Transport	5/12/78	All Holders of Reactor OLs, CPs, Fuel Cycle, Priority I Material and Waste Disposal Licenses
78-04	Installation Error That Could Prevent Closing of Fire Doors	5/15/78	All Holders of Reactor OLs or CPs
78-05	Inadvertent Safety Injection During Cooldown	5/23/78	All Holders of Reactor OLs or CPs
78-06	Potential Common Mode Flooding of ECCS Equipment Rooms at BWR Facilities	5/23/78	All Holders of Reactor OLs or CPs
78-07	Damaged Components of a Bergen-Paterson Series 25000 Hydraulic Test Stand	5/31/78	All Holders of Reactor OLs or CPs
78-08	Environmental Qualification of Safety Related Equipment at Nuclear Power Plants	5/31/78	All Holders of Reactor OLs or CPs
78-09	Arcing of General Electric Company Size 2 Contactors	6/5/78	All Holders of CPs
78-10	Control of Sealed Sources Used in Radiation Therapy	6/14/78	All Medical Licensees in Categories G and G1
78-11	Recirculation M-G Set Overspeed Stops	6/15/78	All Holders of BWR OLs or CPs

IE Circular No. 79-08
May 18, 1979

LISTING OF IE CIRCULARS ISSUED IN
LAST TWELVE MONTHS

Circular No.	Subject	Date of Issue	Issued to
78-12	HPCI Turbine Control Valve Lift Rod Bending	6/30/78	All Holders of BWR OLs or CPs for plants with HPCI Terry Turbine
78-13	Inoperability of Multiple Service Water Pumps	7/10/78	All Holders of Reactor OLs and CPs except for plants located in: AL, AK, CA, FL, GA, LA, MS, SC
78-14	HPCI Turbine Reversing Chamber Hold Down Bolting	7/12/78	All Holders of BWR OLs or CPs for plants with a HPCI Terry Turbine excepting Duane Arnold and Monticello
78-15	Checkvalves Fail to Close In Vertical Position	7/20/78	All Holders of Reactor OLs or CPs
78-16	Limitorque Valve Actuators	7/26/78	All Holders of Reactor OLs or CPs
78-17	Inadequate Guard Training/Qualification and Falsified Training Records	10/13/78	All Holders of and applicants for Reactor OLs
78-18	UL Fire Test	11/6/78	All Holders of Reactor OLs or CPs
78-19	Manual Override (Bypass) of Safety Actuation Signals	12/28/78	All Holders of CPs

IE Circular No. 79-08
May 18, 1979

LISTING OF IE CIRCULARS ISSUED IN
LAST TWELVE MONTHS

Circular No	Subject	Date of Issue	Issued To
79-01	Administration of Unauthorized Byproduct Material to Humans	1/12/79	All Medical Licensees except Teletherapy Medical Licensees and each Radiopharmaceutical Suppliers
79-02	Failure of 120 Volt Vital AC Power Supplies	2/16/79	All Holders of Reactor OLs and CPs
79-03	Inadequate Guard Training- Qualification and Falsified Training Records	2/23/79	All Holders of and applicants for Special Nuclear Material Licenses in Safeguards Group I
79-04	Loose Locking Nut On Limitorque Valve Operators	3/16/79	All Holders of Reactor OLs or CPs
79-05	Moisture Leakage In Stranded Wire Conductors	3/20/79	All Holders of Reactor OLs or CPs
79-06	Failure to Use Syringe and Battle Shields in Nuclear Medicine	4/19/79	All Holders of Medical Licensees except teletherapy licensees
79-07	Unexpected Speed Increase of Reactor Recirculation MG Set Resulted in Reactor Power Increase	5/2/79	All Holders of BWR OL's or CP's

Docket No. 50-264

6-22-79

Dow Chemical U.S.A.
ATTN: Dr. R. R. Langner
Radiation Safety Committee
Building 1603
Midland, MI 48640

Gentlemen:

The enclosed Information Notice No. 79-16 is forwarded to you for information. No specific action is requested and no written response is required. If you desire additional information regarding this matter, please contact this office.

Sincerely,

James G. Keppler
Director

Enclosures:

1. IE Information Notice
No. 79-16
2. List of IE Information
Notices Issued in 1979

cc w/encls:
Central Files
PDR
NSIC
TIC

1P' ~~7907230424~~

J-37

OFFICE ▶	RIII	RIII				
SURNAME ▶	Heishman/gc	Keppler				
DATE ▶	6/22/79					

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

June 22, 1979

IE Information Notice No. 79-16

NUCLEAR INCIDENT AT THREE MILE ISLAND

Description of Circumstances:

On March 28, 1979, the Three Mile Island Nuclear Power Plant, Unit 2 experienced core damage which resulted from a series of events which were initiated by a loss of feedwater transient. The seriousness of this incident makes an understanding of its causes important to research and experimental facilities. This notice transmits copies of Inspection and Enforcement Bulletins (IEBs) 79-05, 79-05A and 79-05B to inform you of the details as known at the time the bulletins were issued. Enclosures 1 and 3 of IEB 79-05 and Enclosure 2 of IEB 79-05A have been deleted from this transmittal. IEB's similar to the 79-05 series were issued to licensees with boiling water reactors and pressurized water reactors supplied by vendors other than Babcock and Wilcox.

No specific action or written response to this Information Notice is required. If you desire additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

Enclosures:

1. IE Bulletin No. 79-05
with Enclosures
2. IE Bulletin No. 79-05A
with Enclosures
3. IE Bulletin No. 79-05B

3pp ~~17~~ 7907020185

IE Information Notice No. 79-16
June 22, 1979

LISTING OF IE INFORMATION NOTICES
ISSUED IN 1979

Information Notice No.	Subject	Date Issued	Issued To
79-01	Bergen-Paterson Hydraulic Shock and Sway Arrestor	2/2/79	All power reactor facilities with an OL or a CP
79-02	Attempted Extortion - Low Enriched Uranium	2/2/79	All Fuel Facilities
79-03	Limiter Valve Geared Limit Switch Lubricant	2/9/79	All power reactor facilities with an OL or a CP
79-04	Degradation of Engineered Safety Features	2/16/79	All power reactor facilities with an OL or a CP
79-05	Use of Improper Materials in Safety-Related Components	3/21/79	All power reactor facilities with an OL or CP
79-06	Stress Analysis of Safety-Related Piping	3/23/79	All Holders of Reactor OL or CP
79-07	Rupture of Radwaste Tanks	3/26/79	All power reactor facilities with an OL or CP
79-08	Interconnection of Contaminated Systems with Service Air Systems Used As the Source of Breathing Air	3/28/79	All power reactor facilities with an OL and Pu Processing fuel facilities
79-09	Spill of Radioactively Contaminated Resin	3/30/79	All power reactor facilities with an OL
79-10	Nonconforming Pipe Support Struts	4/16/79	All power reactor facilities with a CP
79-11	Lower Reactor Vessel Head Insulation Support Problem	5/7/79	All holders of Reactor OLs and CPs

LISTING OF IE INFORMATION NOTICES
ISSUED IN 1979

Information Notice No.	Subject	Date Issued	Issued To
79-12	Attempted Damage to New Fuel Assemblies	5/11/79	All Fuel Facilities Research Reactors, and Power Reactors with an OL or CP
79-13	Indication of Low Water Level in the Oyster Creek Reactor	5/29/79	All Holders of Reactor OLs and CPs
79-14	NRC Position of Electrical Cable Support Systems	6/11/79	All Power Reactor Facilities with a CP
79-15	Deficient Procedures	6/7/79	All holders of Reactor OLs and CPs

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

April 1, 1979

IE Bulletin No. 79-05

NUCLEAR INCIDENT AT THREE MILE ISLAND

Description of Circumstances:

On March 28, 1979 the Three Mile Island Nuclear Power Plant, Unit 2 experienced core damage which resulted from a series of events which were initiated by a loss of feedwater transient. Several aspects of the incident may have general applicability in addition to apparent generic applicability at operating Babcock and Wilcox reactors. This bulletin is provided to inform you of the nuclear incident and to request certain actions.

Actions To Be Taken By Licensees

(Although the specific causes have not been determined for individual sequences in the Three Mile Island event, some of the following may have contributed.)

For all Babcock and Wilcox pressurized water reactor facilities with an operating license:

1. Review the description (Enclosure 1) of the initiating events and subsequent course of the incident. Also review the evaluation by the NRC staff of a postulated severe feedwater transient related to Babcock and Wilcox PWRs as described in Enclosure 2.

These reviews should be directed at assessing the adequacy of your reactor systems to safely sustain cooldown transients such as these.

2. Review any transients of a similar nature which have occurred at your facility and determine whether any significant deviations from expected performance occurred. If any significant deviations are found, provide the details and an analysis of the significance and any corrective actions taken. This material may be identified by reference if previously submitted to the NRC.
3. Review the actions required by your operating procedures for coping with transients. The items that should be addressed include:

6PP' 7904110337

- a. Recognition of the possibility of forming voids in the primary coolant system large enough to compromise the core cooling capability.
 - b. Operator action required to prevent the formation of such voids.
 - c. Operator action required to ensure continued core cooling in the event that such voids are formed.
4. Review the actions requested by the operating procedures and the training instructions to assure that operators do not override automatic actions of engineered safety features without sufficient cause for doing so.
 5. Review all safety related valve positions and positioning requirements to assure that engineered safety features and related equipment such as the auxiliary feedwater system, can perform their intended functions. Also review related procedures, such as those for maintenance and testing, to assure that such valves are returned to their correct positions following necessary manipulations.
 6. Review your operating modes and procedures for all systems designed to transfer potentially radioactive gases and liquids out of the containment to assure that undesired pumping of radioactive liquids and gases will not occur inadvertently.

In particular assure that such an occurrence would not be caused by the resetting of engineered safety features instrumentation. List all such systems and indicate:

- a. Whether interlocks exist to prevent transfer when high radiation indication exists and,
 - b. Whether such systems are isolated by the containment isolation signal.
7. Review your prompt reporting procedures for NRC notification to assure very early notification of serious events.

The detailed results of these reviews shall be submitted within ten (10) days of the receipt of this Bulletin.

April 1, 1979

Reports should be submitted to the Director of the appropriate NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, Division of Reactor Construction Inspection, Washington, D.C. 20555.

For all other operating reactors or reactors under construction, this Bulletin is for information purposes and no report is requested.

Approved by GAO, B180225 (R0072); clearance expires 7-31-80. Approval was given under a blanket clearance specifically for identified generic problems.

Enclosures:

1. Preliminary Notifications
Three Mile Island -
PNO-67 and 67A, B, C, D,
E, F, G
2. Evaluation of Feedwater
Transients w/attachment
3. List of IE Bulletins issued
in last 12 months

EVALUATION OF FEEDWATER TRANSIENT

A loss of offsite power occurred at Davis-Besse on November 29, 1977, which resulted in shrinkage of the primary coolant volume to the degree that pressurizer level indication was lost. A recommendation to convey this information to certain hearing boards resulted in the attached discussion and evaluation of the event. This discussion includes a review of a loss of feedwater safety analysis assuming forced flow, which predicts dispersed primary system voiding, but no loss of core cooling. During the Three Mile Island event, however, the forced flow appears to have been terminated during the transient.

Attachment:
Discussion and Evaluation of
Davis-Besse Transients

EXCERPT FROM MEMORANDUM ENTITLED "CONVEYING NEW INFORMATION TO LICENSING BOARDS - DAVIS-BESSE UNITS 2 & 3 AND MIDLAND UNITS 1 & 2", DATED JANUARY 8, 1979, FROM J.S. CRISWELL TO J.F. STREETER

3. Inspection and Enforcement Report 90-346/78-06 documented that pressurizer level had gone offscale for approximately five minutes during the November 29, 1977 loss of offsite power event. There are some indications that other B&W plants may have problems maintaining pressurizer level indications during transients. In addition, under certain conditions such as loss of feedwater at 100% power with the reactor coolant pumps running the pressurizer may void completely. A special analysis has been performed concerning this event. This analysis is attached as Enclosure 1. Because of pressurizer level maintenance problems the sizing of the pressurizer may require further review.

Also noted during the event was the fact that Tcold went offscale (less than 520°F). In addition, it was noted that the makeup flow monitoring is limited to less than 160 gpm and that makeup flow may be substantially greater than this value. This information should be examined in light of the requirements of GDC 13.

DISCUSSION AND EVALUATION

The event at Davis Besse which resulted in loss of pressurizer level indication has been reviewed by NRR and the conclusion was reached that no unreviewed safety question existed.

The pressurizer, together with the reactor coolant makeup system, is designed to maintain the primary system pressure and water level within their operational limits only during normal operating conditions. Cooldown transients, such as loss of offsite power and loss of feedwater, sometimes result in primary pressure and volume changes that are beyond the ability of this system to control. The analyses of and experience with such transients show, however, that they can be sustained without compromising the safety of the reactor. The principal concern caused by such transients is that they might cause voiding in the primary coolant system that would lead to loss of ability to adequately cool the reactor core. The safety evaluation of the loss of offsite power transient shows that, though level indication is lost, some water remains in the pressurizer and the pressure does not decrease below about 1600 psi. In order for voiding to occur, the pressure must decrease below the saturation pressure corresponding to the system temperature. 1600 psi is the saturation pressure corresponding to 605 F, which is also the maximum allowable core outlet temperature. Voiding in the primary system (excepting the pressurizer) is precluded in this case, since pressure does not decrease to saturation.

The safety analysis for more severe cooldown transients, such as the loss of feedwater event, indicates that the water volume could decrease to less than the system volume exclusive of the pressurizer. During such an event, the emptying of the pressurizer would be followed by a pressure reduction below the saturation point and the formation of small voids throughout much of the primary system. This would not result in the loss of core cooling because the voids would be dispersed over a large volume and forced flow would prevent them from coalescing sufficiently to prevent core cooling. The high pressure coolant injection pumps are started automatically when the primary pressure decreases below 1600 psi. Therefore, any pressure reduction which is sufficient to allow voiding will also result in water injection which will rapidly restore the primary water to normal levels.

For these reasons, we believe that the inability of the pressurizer and normal coolant makeup system to control some transients does not provide a basis for requiring more capacity in these systems.

General Design Criterion 13 of Appendix A to 10 CFR 50 requires instrumentation to monitor variables over their anticipated ranges for "anticipated operational occurrences". Such occurrences are specifically defined to include loss of all offsite power. The fact that T cold goes off scale at 520°F is not considered to be a deviation from this requirement because this indicator is backed up by wide range temperature indication that extends to a low limit of 30°F. Neither do we consider the makeup flow monitoring to deviate since the amount of makeup flow in excess of 160 gpm does not appear to be a significant factor in the course of these occurrences.

The loss of pressurizer water level indication could be considered to deviate from GDC 13, because this level indication provides the principal means of determining the primary coolant inventory. However, provision of a level indication that would cover all anticipated occurrences may not be practical. As discussed above, the loss of feedwater event can lead to a momentary condition wherein no meaningful level exists, because the entire primary system contains a steam water mixture.

It should be noted that the introduction to Appendix A (last paragraph) recognizes that fulfillment of some of the criteria may not always be appropriate. This introduction also states that departures from the Criteria must be identified and justified. The discussion of GDC 13 in the Davis Besse FSAR lists the water level instrumentation, but does not mention the possibility of loss of water level indication during transients. This apparent omission in the safety analysis will be subjected to further review.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

APRIL 5, 1979

IE Bulletin 79-05A

NUCLEAR INCIDENT AT THREE MILE ISLAND - SUPPLEMENT

Description of Circumstances:

Preliminary information received by the NRC since issuance of IE Bulletin 79-05 on April 1, 1979 has identified six potential human, design and mechanical failures which resulted in the core damage and radiation releases at the Three Mile Island Unit 2 nuclear plant. The information and actions in this supplement clarify and extend the original Bulletin and transmit a preliminary chronology of the TMI accident through the first 16 hours (Enclosure 1).

1. At the time of the initiating event, loss of feedwater, both of the auxiliary feedwater trains were valved out of service.
2. The pressurizer electromatic relief valve, which opened during the initial pressure surge, failed to close when the pressure decreased below the actuation level.
3. Following rapid depressurization of the pressurizer, the pressurizer level indication may have lead to erroneous inferences of high level in the reactor coolant system. The pressurizer level indication apparently led the operators to prematurely terminate high pressure injection flow, even though substantial voids existed in the reactor coolant system.
4. Because the containment does not isolate on high pressure injection (HPI) initiation, the highly radioactive water from the relief valve discharge was pumped out of the containment by the automatic initiation of a transfer pump. This water entered the radioactive waste treatment system in the auxiliary building where some of it overflowed to the floor. Outgassing from this water and discharge through the auxiliary building ventilation system and filters was the principal source of the offsite release of radioactive noble gases.
5. Subsequently, the high pressure injection system was intermittently operated attempting to control primary coolant inventory losses through the electromatic relief valve, apparently based on pressurizer level indication. Due to the presence of steam and/or noncondensable voids elsewhere in the reactor coolant system, this led to a further reduction in primary coolant inventory.

8PP. ~~7907020124~~

6. Tripping of reactor coolant pumps during the course of the transient, to protect against pump damage due to pump vibration, led to fuel damage since voids in the reactor coolant system prevented natural circulation.

Actions To Be Taken by Licensees:

For all Babcock and Wilcox pressurized water reactor facilities with an operating license (the actions specified below replace those specified in IE Bulletin 79-05):

1. (This item clarifies and expands upon item 1. of IE Bulletin 79-05.)

In addition to the review of circumstances described in Enclosure 1 of IE Bulletin 79-05, review the enclosed preliminary chronology of the TMI-2 3/28/79 accident. This review should be directed toward understanding the sequence of events to ensure against such an accident at your facility(ies).

2. (This item clarifies and expands upon item 2. of IE Bulletin 79-05.)

Review any transients similar to the Davis Besse event (Enclosure 2 of IE Bulletin 79-05) and any others which contain similar elements from the enclosed chronology (Enclosure 1) which have occurred at your facility(ies). If any significant deviations from expected performance are identified in your review, provide details and an analysis of the safety significance together with a description of any corrective actions taken. Reference may be made to previous information provided to the NRC, if appropriate, in responding to this item.

3. (This item clarifies item 3. of IE Bulletin 79-05.)

Review the actions required by your operating procedures for coping with transients and accidents, with particular attention to:

- a. Recognition of the possibility of forming voids in the primary coolant system large enough to compromise the core cooling capability, especially natural circulation capability.
- b. Operator action required to prevent the formation of such voids.
- c. Operator action required to enhance core cooling in the event such voids are formed.

4. (This item clarifies and expands upon item 4. of IE Bulletin 79-05.)

Review the actions directed by the operating procedures and training instructions to ensure that:

- a. Operators do not override automatic actions of engineered safety features.
 - b. Operating procedures currently, or are revised to, specify that if the high pressure injection (HPI) system has been automatically actuated because of low pressure condition, it must remain in operation until either:
 - (1) Both low pressure injection (LPI) pumps are in operation and flowing at a rate in excess of 1000 gpm each and the situation has been stable for 20 minutes, or
 - (2) The HPI system has been in operation for 20 minutes, and all hot and cold leg temperatures are at least 50 degrees below the saturation temperature for the existing RCS pressure. If 50 degree subcooling cannot be maintained after HPI cutoff, the HPI shall be reactivated.
 - c. Operating procedures currently, or are revised to, specify that in the event of HPI initiation, with reactor coolant pumps (RCP) operating, at least one RCP per loop shall remain operating.
 - d. Operators are provided additional information and instructions to not rely upon pressurizer level indication alone, but to also examine pressurizer pressure and other plant parameter indications in evaluating plant conditions, e.g., water inventory in the reactor primary system.
5. (This item revises item 5. of IE Bulletin 79-05.)
- Verify that emergency feedwater valves are in the open position in accordance with item 8 below. Also, review all safety-related valve positions and positioning requirements to assure that valves are positioned (open or closed) in a manner to ensure the proper operation of engineered safety features. Also review related procedures, such as those for maintenance and testing, to ensure that such valves are returned to their correct positions following necessary manipulations.

6. Review the containment isolation initiation design and procedures, and prepare and implement all changes necessary to cause containment isolation of all lines whose isolation does not degrade core cooling capability upon automatic initiation of safety injection.
7. For manual valves or manually-operated motor-driven valves which could defeat or compromise the flow of auxiliary feedwater to the steam generators, prepare and implement procedures which:
 - a. require that such valves be locked in their correct position; or
 - b. require other similar positive position controls.
8. Prepare and implement immediately procedures which assure that two independent steam generator auxiliary feedwater flow paths, each with 100% flow capacity, are operable at any time when heat removal from the primary system is through the steam generators. When two independent 100% capacity flow paths are not available, the capacity shall be restored within 72 hours or the plant shall be placed in a cooling mode which does not rely on steam generators for cooling within the next 12 hours.

When at least one 100% capacity flow path is not available, the reactor shall be made subcritical within one hour and the facility placed in a shutdown cooling mode which does not rely on steam generators for cooling within 12 hours or at the maximum safe shutdown rate.

9. (This item revises item 6 of IE Bulletin 79-05.)

Review your operating modes and procedures for all systems designed to transfer potentially radioactive gases and liquids out of the primary containment to assure that undesired pumping of radioactive liquids and gases will not occur inadvertently.

In particular, ensure that such an occurrence would not be caused by the resetting of engineered safety features instrumentation. List all such systems and indicate:

- a. Whether interlocks exist to prevent transfer when high radiation indication exists, and
- b. Whether such systems are isolated by the containment isolation signal.

10. Review and modify as necessary your maintenance and test procedures to ensure that they require:
 - a. Verification, by inspection, of the operability of redundant safety-related systems prior to the removal of any safety-related system from service.
 - b. Verification of the operability of all safety-related systems when they are returned to service following maintenance or testing.
 - c. A means of notifying involved reactor operating personnel whenever a safety-related system is removed from and returned to service.
11. All operating and maintenance personnel should be made aware of the extreme seriousness and consequences of the simultaneous blocking of both auxiliary feedwater trains at the Three Mile Island Unit 2 plant and other actions taken during the early phases of the accident.
12. Review your prompt reporting procedures for NRC notification to assure very early notification of serious events.

For Babcock and Wilcox pressurized water reactor facilities with an operating license, respond to Items 1, 2, 3, 4.a and 5 by April 11, 1979. Since these items are substantially the same as those specified in IE Bulletin 79-05, the required date for response has not been changed. Respond to Items 4.b through 4.d, and 6 through 12 by April 16, 1979.

Reports should be submitted to the Director of the appropriate NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, Division of Reactor Operations Inspection, Washington, DC 20555.

For all other reactors with an operating license or construction permit, this Bulletin is for information purposes and no written response is required.

Approved by GAO, B 180225 (R0072); clearance expires 7-31-80. Approval was given under a blanket clearance specifically for identified generic problems.

Enclosures:

1. Preliminary Chronology of TMI-2 3/38/79
Accident Until Core Cooling Restored.
2. List of IE Bulletins issued in last 12 months.

PRELIMINARY

CHRONOLOGY OF TMI-2 3/28/79 ACCIDENT
UNTIL CORE COOLING RESTORED

TIME (Approximate)	EVENT
about 4 AM (t = 0)	Loss of Condensate Pump Loss of Feedwater Turbine Trip
t = 3-6 sec.	Electromatic relief valve opens (2255 psi) to relieve pressure in RCS
t = 9-12 sec.	Reactor trip on high RCS pressure (2355 psi)
t = 12-15 sec.	RCS pressure decays to 2205 psi (relief valve should have closed)
t = 15 sec.	RCS hot leg temperature peaks at 611 degrees F, 2147 psi (450 psi over saturation)
t = 30 sec.	All three auxiliary feedwater pumps running at pressure (Pumps 2A and 2B started at turbine trip). No flow was injected since discharge valves were closed.
t = 1 min.	Pressurizer level indication begins to rise rapidly
t = 1 min.	Steam Generators A and B secondary level very low - drying out over next couple of minutes.
t = 2 min.	ECCS initiation (HPI) at 1600 psi
t = 4 - 11 min.	Pressurizer level off scale - high - one HPI pump manually tripped at about 4 min. 30 sec. Second pump tripped at about 10 min. 30 sec.
t = 6 min.	RCS flashes as pressure bottoms out at 1350 psig (Hot leg temperature of 584 degrees F)
t = 7 min., 30 sec.	Reactor building sump pump came on.

TIME	EVENT
t = 8 min.	Auxiliary feedwater flow is initiated by opening closed valves
t = 8 min. 18 sec.	Steam Generator B pressure reached minimum
t = 8 min. 21 sec.	Steam Generator A pressure starts to recover
t = 11 min.	Pressurizer level indication comes back on scale and decreases
t = 11-12 min.	Makeup Pump (ECCS HPI flow) restarted by operators
t = 15 min.	RC Drain/Quench Tank rupture disk blows at 190 psig (setpoint 200 psig) due to continued discharge of electromatic relief valve
t = 20 - 60 min.	System parameters stabilized in saturated condition at about 1015 psig and about 550 degrees F.
t = 1 hour, 15 min.	Operator trips RC pumps in Loop B
t = 1 hour, 40 min.	Operator trips RC pumps in Loop A
t = 1-3/4 - 2 hours	CORE BEGINS HEAT UP TRANSIENT - Hot leg temperature begins to rise to 620 degrees F (off scale within 14 minutes) and cold leg temperature drops to 150 degrees F. (HPI water)
t = 2.3 hour	Electromatic relief valve isolated by operator after S.G.-B isolated to prevent leakage
t = 3 hours	RCS pressure increases to 2150 psi and electromatic relief valve opened
t = 3.25 hours	RC drain tank pressure spike of 5 psig
t = 3.8 hours	RC drain tank pressure spike of 11 psi - RCS pressure 1750; containment pressure increases from 1 to 3 psig
t = 5 hours	Peak containment pressure of 4.5 psig
t = 5 - 6 hours	RCS pressure increased from 1250 psi to 2100 psi

TIME	EVENT
t = 7.5 hours	Operator opens electromatic relief valve to depressurize RCS to attempt initiation of RHR at 400 psi
t = 8 - 9 hours	RCS pressure decreases to about 500 psi Core Flood Tanks partially discharge
t = 10 hour	28 psig containment pressure spike, containment sprays initiated and stopped after 500 gal. of NaOH injected (about 2 minutes of operation)
t = 13.5 hours	Electromatic relief valve closed to repressurize RCS, collapse voids, and start RC pump
t = 13.5 - 16 hours	RCS pressure increased from 650 psi to 2300 psi
t = 16 hours	RC pump in Loop A started, hot leg temperature decreases to 560 degrees F, and cold leg temperature increases to 400 degrees F. indicating flow through steam generator
Thereafter	S/G "A" steaming to condensor Condensor vacuum re-established RCS cooled to about 280 degrees F., 1000 psi
Now (4/4)	High radiation in containment All core thermocouples less than 460 degrees F. Using pressurizer vent valve with small makeup flow Slow cooldown RB pressure negative

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

April 21, 1979

IE Bulletin 79-05B

NUCLEAR INCIDENT AT THREE MILE ISLAND - SUPPLEMENT

Description of Circumstances:

Continued NRC evaluation of the nuclear incident at Three Mile Island Unit 2 has identified measures in addition to those discussed in IE Bulletin 79-05 and 79-05A which should be acted upon by licensees with reactors designed by B&W. As discussed in Item 4.c. of Actions to be taken by Licensees in IER 79-05A, the preferred mode of core cooling following a transient or accident is to provide forced flow using reactor coolant pumps.

It appears that natural circulation was not successfully achieved upon securing the reactor coolant pumps during the first two hours of the Three Mile Island (TMI) No. 2 incident of March 28, 1979. Initiation of natural circulation was inhibited by significant coolant voids, possibly aggravated by release of noncondensable gases, in the primary coolant system. To avoid this potential for interference with natural circulation, the operator should ensure that the primary system is subcooled, and remains subcooled, before any attempt is made to establish natural circulation.

Natural circulation in Babcock and Wilcox reactor systems is enhanced by maintaining a relatively high water level on the secondary side of the once through steam generators (OTSG). It is also promoted by injection of auxiliary feedwater at the upper nozzles in the OTSGs. The Integrated Control System automatically sets the OTSG level setpoint to 50% on the operating range when all reactor coolant pumps (RCP) are secured. However, in unusual or abnormal situations, manual actions by the operator to increase steam generator level will enhance natural circulation capability in anticipation of a possible loss of operation of the reactor coolant pumps. As stated previously, forced flow of primary coolant through the core is preferred to natural circulation.

Other means of reducing the possibility of void formation in the reactor coolant system are:

- A. Minimize the operation of the Power Operated Relief Valve (PORV) on the pressurizer and thereby reduce the possibility of pressure reduction by a blowdown through a PORV that was stuck open.

8 pp. ~~7905110186~~

- B. Reduce the energy input to the reactor coolant system by a prompt reactor trip during transients that result in primary system pressure increases.

This bulletin addresses, among other things, the means to achieve these objectives.

Actions To Be Taken by Licensees:

For all Babcock and Wilcox pressurized water reactor facilities with an operating license: (Underlined sentences are modifications to, and supersede, IEB-79-05A).

1. Develop procedures and train operation personnel on methods of establishing and maintaining natural circulation. The procedures and training must include means of monitoring heat removal efficiency by available plant instrumentation. The procedures must also contain a method of assuring that the primary coolant system is subcooled by at least 50°F before natural circulation is initiated.

In the event that these instructions incorporate anticipatory filling of the DTSG prior to securing the reactor coolant pumps, a detailed analysis should be done to provide guidance as to the expected system response. The instructions should include the following precautions:

- a. maintain pressurizer level sufficient to prevent loss of level indication in the pressurizer;
- b. assure availability of adequate capacity of pressurizer heaters, for pressure control and maintain primary system pressure to satisfy the subcooling criterion for natural circulation;
- c. maintain pressure - temperature envelope within Appendix G limits for vessel integrity.

Procedures and training shall also be provided to maintain core cooling in the event both main feedwater and auxiliary feedwater are lost while in the natural circulation core cooling mode.

2. Modify the actions required in Item 4a and 4b of IE Bulletin 79-05A to take into account vessel integrity considerations.
4. Review the action directed by the operating procedures and training instructions to ensure that:
 - a. Operators do not override automatic actions of engineered safety features, unless continued operation of engineered

safety features will result in unsafe plant conditions. For example, if continued operation of engineered safety features would threaten reactor vessel integrity then the HPI should be secured (as noted in b(2) below).

- b. Operating procedures currently, or are revised to, specify that if the high pressure injection (HPI) system has been automatically actuated because of low pressure condition, it must remain in operation until either:
 - (1) Both low pressure injection (LPI) pumps are in operation and flowing at a rate in excess of 1000 gpm each and the situation has been stable for 20 minutes, or
 - (2) The HPI system has been in operation for 20 minutes, and all hot and cold leg temperatures are at least 50 degrees below the saturation temperature for the existing RCS pressure. If 50 degrees subcooling cannot be maintained after HPI cutoff, the HPI shall be reactivated. The degree of subcooling beyond 50 degrees F and the length of time HPI is in operation shall be limited by the pressure/temperature considerations for the vessel integrity.
3. Following detailed analysis, describe the modifications to design and procedures which you have implemented to assure the reduction of the likelihood of automatic actuation of the pressurizer PORV during anticipated transients. This analysis shall include consideration of a modification of the high pressure scram setpoint and the PORV opening setpoint such that reactor scram will preclude opening of the PORV for the spectrum of anticipated transients discussed by B&W in Enclosure 1. Changes developed by this analysis shall not result in increased frequency of pressurizer safety valve operation for these anticipated transients.
4. Provide procedures and training to operating personnel for a prompt manual trip of the reactor for transients that result in a pressure increase in the reactor coolant system. These transients include:
 - a. loss of main feedwater
 - b. turbine trip
 - c. Main Steam Isolation Valve closure
 - d. Loss of offsite power
 - e. Low OTSG level
 - f. low pressurizer level.

5. Provide for NRC approval a design review and schedule for implementation of a safety grade automatic anticipatory reactor scram for loss of feed-water, turbine trip, or significant reduction in steam generator level.
6. The actions required in item 12 of IE Bulletin 79-05A are modified as follows:

Review your prompt reporting procedures for NRC notification to assure that NRC is notified within one hour of the time the reactor is not in a controlled or expected condition of operation. Further, at that time an open continuous communication channel shall be established and maintained with NRC.

7. Propose changes, as required, to those technical specifications which must be modified as a result of your implementing the above items.

Response schedule for B&W designed facilities:

- a. For Items 1, 2, 4 and 6, all facilities with an operating license respond within 14 days of receipt of this Bulletin.
- b. For Item 3, all facilities currently operating, respond within 24 hours. All facilities with an operating license, not currently operating, respond before resuming operation.
- c. For Items 5 and 7, all facilities with an operating license respond in 30 days.

Reports should be submitted to the Director of the appropriate NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, Division of Reactor Operations Inspection, Washington, D. C. 20555.

For all other power reactors with an operating license or construction permit, this Bulletin is for information purposes and no written response is required.

Approved by GAO, B180225 (R0072); clearance expires 7/31/80. Approval was given under a blanket clearance specifically for identified generic problems.

Enclosure: Listing of
IE Bulletins Issued
in Last Twelve Months

LISTING OF IE BULLETINS
ISSUED IN LAST TWELVE MONTHS

Bulletin No.	Subject	Date Issued	Issued To
78-05	Malfunctioning of Circuit Breaker Auxiliary Contact Mechanism-General Model CR105X	4/14/78	All Power Reactor Facilities with an OL or CP
78-06	Defective Cutler- Hammer, Type M Relays With DC Coils	5/31/78	All Power Reactor Facilities with an OL or CP
78-07	Protection afforded by Air-Line Respirators and Supplied-Air Hoods	6/12/78	All Power Reactor Facilities with an OL, all class E and F Research Reactors with an OL, all Fuel Cycle Facilities with an OL, and all Priority 1 Material Licensees
78-08	Radiation Levels from Fuel Element Transfer Tubes	6/12/78	All Power and Research Reactor Facilities with a Fuel Element transfer tube and an OL.
78-09	BWR Drywell Leakage Paths Associated with Inadequate Drywell Closures	6/14/79	All BWR Power Reactor Facilities with an OL or CP
78-10	Bergen-Paterson Hydraulic Shock Suppressor Accumulator Spring Coils	6/27/78	All BWR Power Reactor Facilities with an OL or CP

LISTING OF IE BULLETINS
ISSUED IN LAST TWELVE MONTHS

Bulletin No.	Subject	Date Issued	Issued To
78-11	Examination of Mark I Containment Torus Welds	7/21/78	BWR Power Reactor Facilities for action: Peach Bottom 2 and 3, Quad Cities 1 and 2, Hatch 1, Monticello and Vermont Yankee
78-12	Atypical Weld Material in Reactor Pressure Vessel Welds	9/29/78	All Power Reactor Facilities with an OL or CP
78-12A	Atypical Weld Material in Reactor Pressure Vessel Welds	11/24/78	All Power Reactor Facilities with an OL or CP
78-12B	Atypical Weld Material in Reactor Pressure Vessel Welds	3/19/79	All Power Reactor Facilities with an OL or CP
78-13	Failures In Source Heads of Kay-Ray, Inc., Gauges Models 7050, 7050B, 7051, 7051B, 7060, 7060B, 7061 and 7061B	10/27/78	All general and specific licensees with the subject Kay-Ray, Inc. gauges
78-14	Deterioration of Buna-N Components In ASCO Solenoids	12/19/78	All GE BWR facilities with an OL or CP
79-01	Environmental Qualification of Class IE Equipment	2/8/79	All Power Reactor Facilities with an OL or CP

LISTING OF IE BULLETINS
ISSUED IN LAST TWELVE MONTHS

Bulletin No.	Subject	Date Issued	Issued To
79-02	Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts	3/2/79	All Power Reactor Facilities with an OL or CP
79-03	Longitudinal Weld Defects In ASME SA-312 Type 304 Stainless Steel Pipe Spools Manufactured By Youngstown Welding and Engineering Co.	3/12/79	All Power Reactor Facilities with an OL or CP
79-04	Incorrect Weights for Swing Check Valves Manufactured by Velan Engineering Corporation	3/30/79	All Power Reactor Facilities with an OL or CP
79-05	Nuclear Incident at Three Mile Island	4/2/79	All Power Reactor Facilities with an OL and CP
79-05A	Nuclear Incident at Three Mile Island	4/5/79	All B&W Power Reactor Facilities with an OL
79-05B	Nuclear Incident at Three Mile Island - Supplement	4/21/79	All B&W Power Reactor Facilities with an OL and CP
79-06	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/11/79	All Pressurized Water Power Reactors with an OL License except B&W facilities

79-06A	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/14/79	All Pressurized Water Power Reactor Facilities of Westinghouse Design with an Operating License
79-06B	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/14/79	All Combustion Engineering Designed Pressurized Water Power Reactor Facilities with an Operating License
79-07	Seismic Stress Analysis of Safety-Related Piping	4/14/79	All Power Reactor Facilities with an OL or CP
79-08	Events Relevant to BWR Reactors Identified During Three Mile Island Incident	4/14/79	All BWR Power Reactor Facilities with an OL



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

April 18, 1979

MEMORANDUM FOR: Chairman Hendrie
Commissioner Gilinsky
Commissioner Kennedy
Commissioner Bradford
Commissioner Ahearne

FROM: R. F. Fraley, Executive Director
Advisory Committee on Reactor Safeguards

Attached for your information and use is a copy of the recommendations of the Advisory Committee on Reactor Safeguards which were orally presented to and discussed with you on April 17, 1979 regarding the recent accident at the Three Mile Island Nuclear Station Unit 2.

R. F. Fraley
R. F. Fraley
Executive Director

Attachment:
Recommendations of the NRC Advisory Committee
on Reactor Safeguards Re. the 3/28/79 Accident
at The Three Mile Island Nuclear Station Unit 2

44-~~104127495~~ 1P



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

April 20, 1979

Honorable Victor Gilinsky
Acting Chairman
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Dr. Gilinsky:

This letter is in response to yours of April 18, 1979 which requested that the ACRS notify the Commissioners immediately if we believe any of our oral recommendations of April 17 should be acted upon before our next regularly scheduled meeting at which we could prepare a formal letter. The Committee discussed this topic by conference telephone call on April 19 and offers the following comments.

All of the recommendations made by the ACRS in its meeting with the Commissioners on April 17, 1979, are generic in nature and apply to all PWRs. None were intended to require immediate changes in operating procedures or plant modifications of operating PWRs. Such changes should be made only after study of their effects on overall safety. Such studies should be made by the licensees and their suppliers or consultants and by the NRC Staff. The Committee believes that these studies should be begun in the near future on a time scale that will not divert the NRC Staff or the industry representatives from their tasks relating to the cooldown of Three Mile Island Unit 2. However, the Committee believes that it would be possible and desirable to initiate immediately a survey of operating procedures for achieving natural circulation, including the case when offsite power is lost, and the role of the pressurizer heaters in such procedures.

At its meeting on April 16 and 17, 1979, the Committee discussed with the NRC Staff the matter of natural circulation for the Three Mile Island Unit 2 plant. The Committee believes that this matter is receiving careful attention by the NRC Staff and the licensee.

To EDO for Appropriate Action. Distribution: Chm, Cms, PE, OSG, OCA, SECY, PDR, DIA. Rapifaxed to EDO, PA, E. Case. 79-1117.

~~7905140053~~

2pp.

Honorable Victor Gilinsky

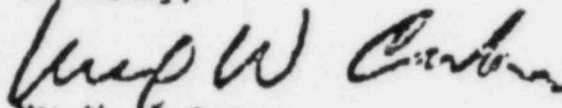
- 2 -

April 20, 1979

The Committee's own recommendations to the Commission on April 17 were not intended to apply to Three Mile Island Unit 2.

We plan to write a further report on these matters at our May 10, 1979 meeting.

Sincerely,

A handwritten signature in dark ink, appearing to read "Max W. Carbon". The signature is fluid and cursive, with the first name "Max" and last name "Carbon" clearly distinguishable.

Max W. Carbon
Chairman

July 9, 1979

Docket No. 50-264

Dow Chemical U.S.A.
ATTN: Dr. R. R. Langner
Radiation Safety Committee
1603 Building
Midland, MI 48640

Gentlemen:

This Information Notice is provided as an early notification of a possibly significant matter. It is expected that recipients will review the information for possible applicability to their facilities. No specific action or response is requested at this time. If you have questions regarding this matter, please contact the Director of the appropriate NRC Regional Office.

Sincerely,

James G. Keppler
Director

Enclosure: IE Information
Notice No. 79-18

cc w/encl:
Central Files
Director, NRR/DPM
Director, NRR/DOR
PDP
NSIC
TIC

1P' ~~7907310161~~

J-38

OFFICE	RIII	RIII				
SURNAME	Heishman/ls	Keppler				
DATE	7/9/79					

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

July 6, 1979

IE Information Notice No. 79-18

SKYLAB REENTRY

Description of Circumstances:

The most recent dates for reentry of Skylab are July 10 to 14, 1979, with July 12, as the most probable date. Recognizing that a hit on a nuclear power plant would be highly unlikely by Skylab debris, the NRC believes it would be prudent for licensees to review their contingency plans in case such an event should actually occur.

The NRC is in communication with the Department of Energy (DOE), and will receive notification from them as soon as the reentry corridor can be established. This notification may occur within 1 to 2 hours before reentry actually occurs. If it is determined that there are any licensed nuclear power plants in the reentry corridor, the plants will receive notification from their respective Regional Office via the dedicated phone line.

This Information Notice is provided as an early notification of a possibly significant matter. It is expected that recipients will review the information for possible applicability to their facilities. No specific action or response is requested at this time. If further NRC evaluations so indicate, an IE Circular or Bulletin will be issued to recommend or request specific licensee actions. If you have questions regarding the matter, please contact the Director of the appropriate NRC Regional Office.

No written response to this information notice is required.

3PP
~~7907120387~~

LISTING OF IE INFORMATION NOTICES
ISSUED IN 1979

Information Notice No.	Subject	Date Issued	Issued To
79-01	Bergen-Paterson Hydraulic Shock and Sway Arrestor	2/2/79	All power reactor facilities with an OL or a CP
79-02	Attempted Extortion - Low Enriched Uranium	2/2/79	All Fuel Facilities
79-03	Limitorque Valve Geared Limit Switch Lubricant	2/9/79	All power reactor facilities with an OL or a CP
79-04	Degradation of Engineered Safety Features	2/16/79	All power reactor facilities with an OL or a CP
79-05	Use of Improper Materials in Safety-Related Components	3/21/79	All power reactor facilities with an OL or CP
79-06	Stress Analysis of Safety-Related Piping	3/23/79	All Holders of Reactor OL or CP
79-07	Rupture of Radwaste Tanks	3/26/79	All power reactor facilities with an OL or CP
79-08	Interconnection of Contaminated Systems with Service Air Systems Used As the Source of Breathing Air	3/28/79	All power reactor facilities with an OL and Pu Processing fuel facilities
79-09	Spill of Radioactively Contaminated Resin	3/30/79	All power reactor facilities with an OL
79-10	Nonconforming Pipe Support Struts	4/16/79	All power reactor facilities with a CP
79-11	Lower Reactor Vessel Head Insulation Support Problem	5/7/79	All holders of Reactor OLs and CPs

LISTING OF IE INFORMATION NOTICES
ISSUED IN 1979

Information Notice No.	Subject	Date Issued	Issued To
79-12	Attempted Damage to New Fuel Assemblies	5/11/79	All Fuel Facilities Research Reactors, and Power Reactors with an OL or CP
79-13	Indication of Low Water Level in the Oyster Creek Reactor	5/29/79	All Holders of Reactor OLs and CPs
79-14	NRC Position of Electrical Cable Support Systems	6/11/79	All Power Reactor Facilities with a CP
79-15	Deficient Procedures	6/7/79	All Holders of Reactor OLs and CPs
79-16	Nuclear Incident at Three Mile Island	6/22/79	All Research Reactors and Test Reactors with OLs
79-17	Source Holder Assembly Damage Damage From Misfit Between Assembly and Reactor Upper Grid Plate	6/20/79	All Holders of Reactor OLs and CPs



DOW CHEMICAL U.S.A.

August 31, 1979

MIDLAND, MICHIGAN 48640

50-264

Mr. James G. Keppler, Director
US Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Mr. Keppler:

This letter is in response to IE Bulletin No. 79-19 concerning the packaging of low level radioactive waste for transport and burial. The Dow Chemical Company concurs with efforts of the Nuclear Regulatory Commission to improve the status of safe packaging and transport of low level radioactive waste for burial. However, the thrust of the Nuclear Regulatory Commission effort should be towards correcting the abusers of the transport and burial legal system.

The Dow Chemical Company has and will continue to comply with all Nuclear Regulatory Commission and Department of Transportation regulations regarding packaging and transport of low level radioactive waste. We maintain a current set of license requirements placed on the waste burial firm by those Agreement States in which The Dow Chemical Company's low level radioactive waste is buried. Our low level radioactive waste is packaged in accordance with the burial criteria established by the Agreement States.

By law, a burial firm is required to maintain public burial records for inspection. Therefore information pertaining to waste buried by The Dow Chemical Company is a matter of public records and can be extracted from said records.

Pursuant to Item 9 of IE Bulletin No. 79-19, The Dow Chemical Company provides the Nuclear Regulatory Commission with the following information:

1. The Dow Chemical Company shipped 745.5 ft³ of low level radioactive waste to Barnwell, South Carolina on April 19, 1979. No burial shipments were made in 1978.
2. The burial shipment contained 16.279343 Curies. The major isotopes in the shipment were carbon-14 and tritium.
3. Liquid low level radioactive waste was solidified by Dow media. Dow media is a Chem-Nuclear Systems Inc. (CNSI) recognized solidification process that results in a material meeting the burial standards of CNSI.



J-39

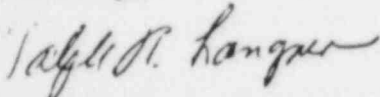
Mr. James G. Keppler

2

August 31, 1979

The Nuclear Regulatory Commission should investigate the packaging and transport operating procedures of those offenders who do not comply with the law rather than burdening those licensees who package and transport low level radioactive waste properly. The Dow Chemical Company has operated within the confines of the Federal Regulations and therefore, should not be subject to a "paper harassment" that is unnecessary, unwarranted and most important, unproductive for the industry.

Sincerely,



Ralph R. Langner, Chairman
Radiation Safety Committee
Health & Environmental Science
1603 Building
517/636-4344

bjd

cc: Nuclear Regulatory Commission, Office of Inspection and Enforcement,
Division of Fuel Facility and Materials Safety Inspection,
Washington, DC 20555

SEP 7 1979

Docket No. 50-264

Dow Chemical U.S.A.
ATTN: Dr. R. R. Langner
Radiation Safety Committee
1603 Building
Midland, MI 48640

Gentlemen:

With this Information Notice the Nuclear Regulatory Commission is extending an existing mechanism previously used for informing facility licensees of significant operating events to include informing operator licensees of significant events which could impact on conditions of their NRC licenses. This Information Notice is being reissued to correct a word omission and a punctuation error that, when taken together, completely changed the intent of a statement. The changed statement is underlined in the text of the Information Notice.

It is requested that the facility licensee provide copies of this Information Notice to all NRC licensed individuals at the facility. No specific response is requested at this time. If you have questions regarding this matter please contact the Director of the appropriate NRC Regional Office.

Sincerely,

James G. Keppler
Director

Enclosure: IE Information
Notice No. 79-20, Rev. 1

cc w/encl:
Central Files
Director, NRR/DPM
Director, NRR/DOR
PDR
NSIC
TIC

RIII
Heishman/sr

RIII
Keppler

9/6/79

9/6

1P-79100 20133

J-40

5pp

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

September 7, 1979

IE Information Notice No. 79-20 Rev. 1

NRC ENFORCEMENT POLICY - NRC LICENSED INDIVIDUALS

Background:

In the past, NRC licensed individuals have been cited by the NRC for failure to comply with the conditions of their licenses. These items of noncompliance can generally be characterized as serious or repeated failures to follow reactor operating procedures. Two recent events involving the radiation overexposure of NRC licensed individuals through their violation of utility procedures, facility Technical Specifications and the Code of Federal Regulations have raised questions about the exercise of their responsibilities.

The purpose of this Information Notice is two-fold:

- (1) To remind the NRC licensed individuals of their responsibilities, not only in the proper operation of the facility controls, but in compliance with the facility administrative procedures, and
- (2) To summarize the enforcement sanctions available to the NRC for use against licensed individuals.

Description of Circumstances:

1. Responsibilities

Facility licensees are charged with the responsibility to design, construct and operate their plants in accordance with NRC requirements to assure that public health and safety are protected. The role of NRC licensed individuals is no less important in the overall Regulatory scheme. The NRC recognizes that timely actions by NRC licensed individuals are an important part of safety. Reliance on these actions is a part of the defense-in-depth concept. Specifically, the NRC requires that:

- (1) Only licensed operators are permitted to manipulate the controls that directly affect reactivity (10 CFR 50.54 (i))
- (2) Licensed operators are required to be present at the controls at all times during the operation of the facility (10 CFR 50.54 (k))

~~7908220108~~ 5pp

- (3) Operation of mechanisms and apparatus other than controls which may indirectly affect the power level or reactivity of a reactor shall only be accomplished with the knowledge and consent of an operator licensed in accordance with Part 55 (10 CFR 50.54 (j))
- (4) Licensed senior operators are required to be present at the facility during specified conditions, and available or on call at other times during operation (10 CFR 50.54 (m))
- (5) The NRC licensed individual shall observe all applicable rules, regulations and orders of the Commission, whether or not stated in the license (10 CFR 55.31(d))

The above requires the NRC licensed individual to comply with the requirements pertaining to the operation of the facility and manipulation of its controls and to comply with radiation safety procedures implementing 10 CFR 20.

NRC policy for the responsibility for safe operation of NRC licensed facilities continues to be as follows:

- (1) The facility licensee is responsible for assuring that the facility is operated within the requirements of the license, Technical Specifications, rules, regulations, and Orders of the NRC and for the actions of their employees.
- (2) NRC licensed individuals are responsible for taking timely and proper actions so as not to create or cause a hazard to "safe operation of the facility" (i.e. actions or activities, including failure to take action, related to the facility which could have an adverse affect on the health and safety of the public, plant workers or the individuals).

2. Enforcement Sanctions

On December 31, 1974, the then AEC sent a letter to all facility licensees containing the criteria for determining enforcement action and the categories of noncompliance with AEC regulatory requirements. Those criteria and categories are applicable to NRC licensed individuals as well as facility licensees.

Paragraph 55.40(b) of Title 10 of the Code of Federal Regulations prescribes that NRC issued operator licenses may be revoked, suspended or modified for failure to observe any terms or conditions of any rule, regulation or Order of the Commission, or any conduct determined to be a hazard to safe operation of the facility. These would generally involve serious items of noncompliance where: (1) the individuals' action clearly demonstrate inattention to duties or disregard for requirements including technical specifications and operating procedures; (2) the NRC licensed individual fails to take a required action or takes an independent action that results in significant actual or potential safety consequences; or (3) there is repetitive noncompliance with regulatory requirements.

Examples of situations which could result in violations include:

- (1) Noting a serious violation of procedural requirements and not taking corrective action.
- (2) Unauthorized bypassing of required reactor safety systems
- (3) Defeating alarms which have serious safety significance
- (4) Unauthorized abandoning of reactor controls
- (5) Knowingly taking actions that violate TS Limiting Conditions for Operation

The examples listed above involve the failure of an NRC licensed individual to follow procedures and adhere to controls. These are violations of NRC requirements. In the past the NRC has issued Notices of Violation, as provided for in 10 CFR 2.201, and suspended, modified or revoked the license, as provided for in 10 CFR 55.40 (b), of NRC licensed individuals. The issuance of civil monetary penalties, as provided for in 10 CFR 2.205 and 10 CFR 55.50, or criminal charges, as provided for in 10 CFR 55.50, have not been previously used against NRC licensed individuals but may be used if the circumstances warrant such action.

The Commission will continue to monitor the performance of NRC licensed individuals and will continue to take the appropriate enforcement action against NRC licensed individuals.

No written response to this Information Notice is required. If you have questions regarding this matter, please contact the Director of the appropriate NRC Regional Office.

Enclosure: List of IE Information
Notices Issued in 1979

LISTING OF IE INFORMATION NOTICES
ISSUED IN 1979

Information Notice No.	Subject	Date Issued	Issued To
79-01	Bergen-Paterson Hydraulic Shock and Sway Arrestor	2/2/79	All power reactor facilities with an OL or a CP
79-02	Attempted Extortion - Low Enriched Uranium	2/2/79	All Fuel Facilities
79-03	Limatorque Valve Geared Limit Switch Lubricant	2/9/79	All power reactor facilities with an OL or a CP
79-04	Degradation of Engineered Safety Features	2/16/79	All power reactor facilities with an OL or a CP
79-05	Use of Improper Materials in Safety-Related Components	3/21/79	All power reactor facilities with an OL or CP
79-06	Stress Analysis of Safety-Related Piping	3/23/79	All Holders of Reactor OL or CP
79-07	Rupture of Radwaste Tanks	3/26/79	All power reactor facilities with an OL or CP
79-08	Interconnection of Contaminated Systems with Service Air Systems Used As the Source of Breathing Air	3/28/79	All power reactor facilities with an OL and Pu Processing fuel facilities
79-09	Spill of Radioactively Contaminated Resin	3/30/79	All power reactor facilities with an OL
79-10	Nonconforming Pipe Support Struts	4/16/79	All power reactor facilities with a CP
79-11	Lower Reactor Vessel Head Insulation Support Problem	5/7/79	All holders of Reactor OLs and CPs

LISTING OF IE INFORMATION NOTICES
ISSUED IN 1979

Information Notice No.	Subject	Date Issued	Issued To
79 -12	Attempted Damage to New Fuel Assemblies	5/11/79	All Fuel Facilities Research Reactors, and Power Reactors with an OL or CP
79-13	Indication of Low Water Level in the Oyster Creek Reactor	5/29/79	All Holders of Reactor OLs and CPs
79-14	NRC Position of Electrical Cable Support Systems	6/11/79	All Power Reactor Facilities with a CP
79-15	Deficient Procedures	6/7/79	All Holders of Reactor OLs and CPs
79-16	Nuclear Incident at Three Mile Island	6/22/79	All Research Reactors and Test Reactors with OLs
79-17	Source Holder Assembly Damage From Misfit Between Assembly and Reactor Upper Grid Plate	6/20/79	All Holders of Reactor OLs and CPs
79-18	Skylab Reentry	7/5/79	All Holders of Reactor OLs
79-19	Pipe Cracks In Stagnant Borated Water Systems At PWR Plants	7/17/79	All Holders of Reactor OLs and CPs
79-20	NRC Enforcement Policy NRC Licensed Individuals	8/10/79	All Holders of Reactor OLs and CPs and Production Licensees with Licensed Operators

files

SEP 12 1979

Docket No. 50-264

Dow Chemical U.S.A.
ATTN: Dr. R. R. Langner
Radiation Safety Committee
Building 1603
Midland, MI 48640

Gentlemen:

Enclosed is IE Information Notice No. 79-21, "Transportation and Commercial Burial of Radioactive Material", which provides information on packaging and disposal of radioactive material.

Sincerely,

James G. Keppler
Director

Enclosures:

1. IE Information Notice
No. 79-21
2. List of Information Notices
Issued in Last Six Months

cc w/encls:
Central Files
PDR
NSIC
TIC

RIII
X
Hershman/gc

RIII
X
Keppler

9/7/79

~~1p. 7909 260156~~

J-41

6pp

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

September 7, 1979

IE Information Notice No. 79-21

TRANSPORTATION AND COMMERCIAL BURIAL OF RADIOACTIVE MATERIAL

On July 10, 1979, the Governors of the Agreement States of Nevada, South Carolina, and Washington notified NRC Chairman Hendrie of the serious and repeated disregard for the rules governing the shipments of low-level radioactive wastes to their burial facilities. The problems causing the Governors' concern may be summarized as contaminated packages; improper loading of packages which results in unnecessary radiation exposure; packages containing liquids when liquids or free-standing water are not authorized to be buried; leaking packages; improper labeling of packages; and improper paperwork for shipments.

Recently, you should have received either IE Bulletin No. 79-19 or 79-20 on this subject. The enclosures to this Notice provide information regarding the regulatory requirements for the packaging, transportation and disposal of radioactive material. The requirements for packaging and transport referenced herein are applicable to shipments of all radioactive material.

The enclosed summary of radioactive waste burial criteria defines the current burial-site license and State requirements on waste form and packaging. A summary of the requirements for transportation is in the enclosed DOT publication, "A Review of the DOT Regulations for Transportation of Radioactive Materials." The enclosures are intended only as a convenient reference; they are neither a substitute for the actual regulations nor a copy of the burial site license or other burial site documents. The DOT regulatory requirements can be found in 49 CFR Parts 170-179 (Oct. 1, 1977). The NRC requirements are in 10 CFR Part 71.

To conduct your waste disposal operations properly you must comply with NRC and DOT requirements for packaging and transportation, and the waste packaged for eventual disposal at any of the three operating waste-burial sites must be in a form authorized in the particular burial-site license and State requirements. To assure that the latter requirements are met, you should coordinate your waste disposal activities with the waste collection companies and/or the waste burial site operators. The sites receiving wastes for burial are operated either by the Nuclear Engineering Co., Inc. (502-426-7160), or Chem-Nuclear Systems, Inc. (206-827-0711).

Questions about licensing requirements for NRC packages can be addressed to the NRC's Transportation Branch (301-427-4122). Questions about DOT packaging and transport requirements can be addressed to the Materials Transportation Bureau of DOT (202-426-2311). Questions about the IE Bulletins or this Information Notice can be addressed to the appropriate NRC Regional Office listed in 10 CFR Part 20, Appendix D.

6pp
7908220103

No written response to this Information Notice is required.

Enclosures:

1. Burial Criteria
2. DOT Publication

LOW-LEVEL RADIOACTIVE WASTE BURIAL CRITERIA
AS OF JULY 11, 1979

WASTE FORM	SITE		
	South Carolina ¹	Nevada ²	Washington ³
1. Liquid scintillation fluids packed in 2x absorbent ⁴ :			
(a) vermiculite as absorbent	Disposal not permitted	Disposal permitted but specific approval required	Disposal permitted but specific approval required
(b) diatomaceous earth as absorbent	Not permitted	Permitted	Permitted
(c) other absorbents (not rags, tissue etc.)	Not permitted	Specific approval required	Specific approval required
2. Other liquids packed in 2x absorbent ⁴ for immobilization	Not permitted	Not Permitted	Permitted, but no free standing liquid
3. Unpackaged bulk solids (e.g. ores, rubble)	Permitted but specific approval required	Permitted but specific approval required	Not Permitted
4. Solidification media:			
(a) cement, urea for formaldehyde, Dow media, Delaware custom	Permitted for aqueous wastes	Permitted	Permitted
(b) other	Not permitted	Permitted	Permitted
5. Radiological hazard greater than chemical unless specifically approved	Permitted	Permitted	Permitted
6. Pyrophoric material	Not permitted	Not permitted unless specifically approved	Not permitted unless specifically approved

¹ Barnwell, S.C., operated by Chem-Nuclear.

² Beatty, Nevada, operated by NECO.

³ Hanford, Washington, operated by NECO.

⁴ Liquids alternated with layers of absorbent form the most effective packaging (2x absorbent for liquid present or likely to be formed in transit).

LOW-LEVEL RADIOACTIVE WASTE BURIAL CRITERIA
AS OF JULY 11, 1979
-Continued-

WASTE FORM	SITE		
	South Carolina ¹	Nevada ²	Washington ³
7. Biological wastes (e.g., carcasses) packed in equivalent to 2x absorbent ⁴	Permitted, but rock salt to preserve is preferred.	Permitted	Permitted
8. Oil Content	No more than 1% by volume.	No specification	No specification
9. Dewatered resins	Permitted	Permitted	Permitted
10. Evaporator bottoms	Must be solidified with agents in #4.	Must be a solid	Must be a solid
11. Kr 85 and Xe 133	Permitted in DOT pkg, 1.5 atm, 100 Ci/pkg.	Permitted in DOT pkg, 1 atm, 100 Ci/pkg, 1000 Ci in special pkg.	Permitted in DOT pkg, 1.5 atm, Ci/pkg.
12. Curie content per package for radiation control and handling.	Special if > 2500 Ci.	Special if > 1600 Ci for dispersed or if > 50 Ci for sealed sources.	Special handling for large quantities.
13. Transuranics greater than 10 nanocuries/gram	Not permitted	Not permitted	Permitted
14. SNM package content	Special if > 50 g.	350 g U-235 or 200 g U-233 or ratio ≤ 1 .	100 g U-232 or 60 g U-233 or Pu or ratio ≤ 1 ; $\leq 15\text{g/ft}^3$.
15. DOT containers as received at the site	Permitted	Permitted except fiberboard or cardboard or similar materials	Permitted
16. Liners removed from DOT shipping containers	Permitted	Permitted	Permitted

LISTING OF IE INFORMATION NOTICES
ISSUED IN LAST SIX MONTHS

Information Notice No.	Subject	Date Issued	Issued To
79-05	Use of Improper Materials in Safety-Related Components	3/21/79	All power reactor facilities with an OL or CP
79-06	Stress Analysis of Safety-Related Piping	3/23/79	All Holders of Reactor OL or CP
79-07	Rupture of Radwaste Tanks	3/26/79	All power reactor facilities with an OL or CP
79-08	Interconnection of Contaminated Systems with Service Air Systems Used As the Source of Breathing Air	3/28/79	All power reactor facilities with an OL and Pu Processing fuel facilities
79-09	Spill of Radioactively Contaminated Resin	3/30/79	All power reactor facilities with an OL
79-10	Nonconforming Pipe Support Struts	4/16/79	All power reactor facilities with a CP
79-11	Lower Reactor Vessel Head Insulation Support Problem	5/7/79	All holders of Reactor OLs and CPs
79-12	Attempted Damage to New Fuel Assemblies	5/11/79	All Fuel Facilities Research Reactors, and Power Reactors with an OL or CP
79-13	Indication of Low Water Level in the Oyster Creek Reactor	5/29/79	All Holders of Reactor OLs and CPs
79-14	NRC Position of Electrical Cable Support Systems	6/11/79	All Power Reactor Facilities with a CP
79-15	Deficient Procedures	6/7/79	All Holders of Reactor OLs and CPs

LISTING OF IE INFORMATION NOTICES
ISSUED IN LAST SIX MONTHS

Information Notice No.	Subject	Date Issued	Issued To
79-16	Nuclear Incident at Three Mile Island	6/22/79	All Research Reactors and Test Reactors with OLs
79-17	Source Holder Assembly Damage Damage From Misfit Between Assembly and Reactor Upper Grid Plate	6/20/79	All Holders of Reactor OLs and CPs
79-18	Skylab Reentry	7/5/79	All Holders of Reactor OLs
79-19	Pipe Cracks In Stagnant Borated Water Systems At PWR Plants	7/17/79	All Holders of Reactor OLs and CPs
79-20	NRC Enforcement Policy - NRC Licensed Individuals Reactor Facilities with an OL or CP and to Pro-	8/14/79	All Research Reactor Test Reactor and Power Reactor Facilities with an OL or CP and to pro- duction Facility licen- sees that employ NRC Licensed Operators

FEB 1 1980

Docket No. 50-264

Dow Chemical U.S.A.
ATTN: Dr. R. R. Langner
Radiation Safety Committee
1603 Building
Midland, MI 48640

Gentlemen:

The enclosed IE Circular No. 80-02 is forwarded to you for information.

If there are any questions related to your understanding of the suggested actions, please contact this office.

Sincerely,

James G. Keppler
Director

Enclosure: IE Circular
No. 80-02

cc w/encl:
Central Files
Director, NRR/DPM
Director, NRR/DOR
PDR
NSIC
TIC

J-44

~~8003120084~~

1p.

OFFICE	RIII	RIII				
SURNAME	Heishman/km	Keppler				
DATE	2/1/80	2/1				

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

SSINS No.: 6830
Accession No.:
~~7012190657~~

3pp

February 1, 1980

IE Circular No. 80-02

NUCLEAR POWER PLANT STAFF WORK HOURS

Description of Circumstances:

Studies indicate that with fatigue, especially because of loss of sleep, an individual's detection of visual signals deteriorates markedly, the time it takes for a person to make a decision increases and more errors are made, and reading rates decrease. Other studies show that fatigue results in personnel ignoring some signals because they develop their own subjective standards as to what is important, and as they become more fatigued they ignore more signals.

Inspections of personnel performance and training since the accident at Three Mile Island, have shown that in certain situations facility personnel are either required or allowed to remain on duty for extended periods of time. Also, complaints have been received from some licensed nuclear power plant operators concerning the number of continuous hours they have been on duty.

Licensee management is responsible for providing a sufficient number of trained personnel who are in the proper physical condition to operate and maintain the plant. Licensee management should review their administrative procedures covering the working hours of nuclear power plant staff. These procedures should establish a sound policy covering working hours for plant staff who perform safety related functions (e.g., senior reactor operators, reactor operators, health physicists, auxiliary operators, I&C technicians, key maintenance personnel, etc.)

Subcommittee ANS-3 is currently developing criteria to address the subject of operator work hours. These guidelines will become a part of ANSI N18.7. The NRC is also considering issuing requirements for administrative procedures that would control staff overtime. Until either the ANSI Standard is issued and endorsed by NRC (via a Regulatory Guide) or separate requirements are issued by NRC, it is recommended that the following guidance be used. The guidance should be applied to all personnel performing a safety related function:

1. Scheduled work should be limited to the following maximum work hours:
 - a. An individual should not be permitted to work more than 12 hours straight.

7912190657

3pp

- b. There should be at least a 12-hour break between all work periods.
 - c. An individual should not work more than 72-hours in any 7-day period.
 - d. An individual should not work more than 14 consecutive days without having 2 consecutive days off.
- 2. In the event that special circumstances arise that require deviation from the above, such deviations should be authorized by the Station Manager with appropriate documentation of the cause. Plants should be staffed and schedules developed to operate such that exceptions are not required.
 - 3. If an operator is required to work in excess of 12 continuous hours, his duties should be carefully selected. It is preferable that he not be assigned any task that affects core reactivity or could possibly endanger the safe operation of the plant.

No written response to this Circular is required. If you desire additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

IE Circular No. 80-02
February 1, 1980

Enclosure

RECENTLY ISSUED
IE CIRCULARS

Circular No.	Subject	Date of Issue	Issued to
80-01	Service Advice for GE Induction Disc Relays	1/17/80	All licensees of nuclear power reactor operating facilities and holders of nuclear power reactor CPs
79-25	Shock Arrestor Strut Assembly Interference	12/20/79	All licensees and holders of power reactor CPs
79-24	Proper Installation and Calibration of Core Spray Pipe Break Detection Equipment on BWRs.	11/26/79	All Holders of a Power Reactor OL or CP
79-23	Motor Starters and and Contactors Failed to Operate	11/26/79	All Power Reactor Operating Facilities and Holders of Reactor CPs
79-22	Stroke Times for Power Operated Relief Valves	11/16/79	All Power Reactor Operating Facilities and all Utilities having a CP
79-21	Prevention of Unplanned Releases of Radioactivity	10/19/79	All holders of Power Reactor OLs and CPs
79-20	Failure of GTE Sylvania Relay, Type PM Bulletin 7305, Catalog 5U12-11-AC with a 12V AC Coil	9/24/79	All holders of Power Reactor OLs and CPs
79-19	Loose Locking Devices on Ingersoll-Rand Pumps	9/13/79	All Holders of Power Reactor OLs and CPs
79-18	Proper Installation of Target Rock Safety-Relief	9/10/79	All Holders of Power Reactor OLs and CPs
79-17	Contact Problem in SB-12 Switches on General Electric Company Metalclad Circuit Breakers	8/14/79	All Power Reactor Licensees with a CP and/or OL

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-264/80-02

Docket No. 50-264

License No. R-108

Licensee: Dow Chemical U.S.A.
1803 Building
Midland, MI 48640

Facility Name: TRIGA Reactor

Inspection At: TRIGA Reactor Site, Midland, MI

Inspection Conducted: September 10-12, 1980

Inspector: *P. C. Lovendale*
P. C. Lovendale

9/22/80

Approved By: *W. L. Fisher*
W. L. Fisher, Chief
Fuel Facility Projects and
Radiation Support Section

9/22/80

Inspection Summary

Inspection on September 10-12, 1980 (Report No. 50-264/80-02)

Areas Inspected: Routine, unannounced inspection of radiation protection and radwaste management program, including: qualifications; audits; training; radiation protection procedures; instruments and equipment; exposure control; posting, labeling, and control; surveys; notifications and reports; records of effluents; radioactive waste; IE Bulletin No. 79-19; IE Circular No. 80-14; a previous item of noncompliance; and transportation activities. The inspection involved 13 inspector-hours onsite by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

WPP

~~8410290403~~

J-48.

DETAILS

1. Persons Contacted

*Dr. O. U. Anders, Reactor Supervisor
*Mr. K. J. Kelly, Assistant Reactor Supervisor
*Mr. J. M. Macki, Senior Research Manager
*Mr. E. E. Bickel, Health Physicist
*Dr. C. W. Kocher, Radiochemist
Mr. T. W. Parsons, Health Physicist

*Denotes those present at the exit interview.

2. General

This inspection, which began with visual observation of facilities and equipment, posting, labeling, and access controls at 10:30 a.m. on September 10, 1980, was conducted to examine the routine operational radiation protection and radwaste management program. During this and subsequent tours, the inspector used a licensee survey instrument to monitor the reactor area. The highest radiation level, about 7 mR/hr, was found at waist level above the reactor pool. No problems were noted.

3. Previous Item of Noncompliance

(Closed) Noncompliance (50-264/79-02): Failure of the Reactor Operations Committee to meet during second quarter of 1979. A "reminder board" is now in use to prevent recurrence (Paragraph 5).

4. Organization

The following changes in the reactor staff have been made since the last radiation protection inspection (October 1979): Mr. K. J. Kelly has been appointed Assistant Reactor Supervisor; Mr. J. M. Macki has replaced Mr. H. Gill as Research Manager in building 1602; Mr. E. E. Bickel has replaced Mr. T. W. Parsons as Reactor Health Physicist. No problems were identified.

5. Licensee Audits

Minutes of the Reactor Operations Committee (ROC) and Radiation Safety Committee (RSC) meetings held since October 1979 were reviewed. Membership and meeting frequencies for both committees were as required in Technical Specifications I.2 and I.5.

As a result of a previous inspection,^{1/} the licensee instituted a "reminder board," which lists required due dates for ROC and RSC meetings so that they will not be missed.

No items of noncompliance were identified.

6. Training

Except for the reactor staff, no other individuals frequent the reactor area. The reactor staff receives radiation protection training during annual requalification, which meets the requirements of 10 CFR 19.12. Also, female employees receive additional training as outlined in Regulatory Guide 8.13.

No items of noncompliance were identified.

7. Radiation Protection Procedures

The inspector reviewed the procedures contained in the "TRIGA Operations Manual," including calibration procedures for the area radiation monitor, continuous air monitor, and water radiation monitor.

No items of noncompliance were identified.

8. Instruments and Equipment

a. Portable Survey Instruments

Operable and calibrated instruments capable of detecting beta, gamma, and neutron radiations are available at the reactor. Additional instruments are available from the Industrial Hygiene Office as needed. Records indicated that instruments are calibrated either quarterly (ionization type and neutron meters) or annually (Geiger-Mueller type meters). No problems were noted.

b. Area Radiation Monitors

Records reviewed indicate that the monitor was calibrated in March and August 1980. (Technical Specification G.3 requires an annual frequency.) The inspector observed a calibration check of this instrument and verified that the monitor's audible alarm was functional and that the alarm setpoint was correct. No problems were noted.

c. Continuous Air Monitor (CAM)

The inspector reviewed records of calibration and alarm setpoint checks performed since October 1979 and noted that the frequency

^{1/} IE Inspection Report No. 50-264/79-02.

was as required by Technical Specification G.3. The inspector observed a calibration check of this instrument and verified that the monitor's audible alarm and visual alarms were functional and that the alarm setpoint was correct. No problems were noted.

No items of noncompliance were identified.

9. Exposure Control

a. External Exposure

The vendor's film badge reports were reviewed for the period October 1979 to date. The greatest whole body and extremity doses received in CY1979 were 210 mrem and 180 mrem, respectively. No measurable whole body dose has been received in CY1980 to date; the highest extremity dose was 40 mrem. No problems were noted.

b. Internal Exposure

The licensee has no routine bioassay program for the reactor staff and relies on the CAM, contamination surveys, and pool activity measurements to define any problem areas. The inspector reviewed records of these indicators; no problems were noted. A previous inspection^{2/} noted that pool water was last analyzed for tritium in 1971. The licensee has recently analyzed the pool water for tritium and found it to be less than approximately 1×10^{-5} $\mu\text{Ci/ml}$, their lower detection limit. No problems were noted.

The inspector reviewed action taken by the licensee relating to IE Circular No. 80-14 "Radioactive Contamination of Plant Demineralized Water System and Resultant Internal Contamination of Personnel." The only possible means of contaminating the demineralized water storage tank is through a hose used to add makeup water to the reactor pool. The hose is short enough so that it can not be physically submersed into the pool. It is unlikely that contamination of the demineralized water tank could occur via this route. No problems were noted.

No items of noncompliance were identified.

10. Posting and Labeling

The licensee's compliance with posting and labeling requirements specified in 10 CFR 19.11 and 10 CFR 20.203 were reviewed.

No items of noncompliance were identified.

^{2/} IE Inspection Report No. 50-264/79-02.

11. Transportation Activities

The licensee stated that no radioactive material has been received under the TRIGA license since the last radiation protection inspection (October 1979). The inspector reviewed records of radioactive shipments made since October 1979. No problems were noted.

The licensee has not submitted a quality assurance program satisfying the requirements of 10 CFR 71, Appendix E and has no plans to do so. No shipments of greater than Type A quantities have been made.

The inspector reviewed the licensee's response to IE Bulletin No. 79-19. No problems were noted.

No items of noncompliance were identified.

12. Surveys

The reactor staff performs contamination and radiation surveys monthly. The Industrial Hygiene Office performs quarterly contamination surveys of the facility. Results of these surveys were reviewed. Only occasional low-level contamination is found in known contamination areas.

No items of noncompliance were identified.

13. Notifications and Reports

A review of records and discussions with licensee representatives indicated compliance with 10 CFR 19 and 10 CFR 20 requirements.

No items of noncompliance were identified.

14. Radioactive Waste

a. Liquid Radioactive Waste

The licensee stated that they do not release liquid radioactive waste from the facility. Any liquids requiring disposal are solidified and shipped to a licensed burial site.

- b. The facility has no gaseous effluent monitor, since calculations in the SAR determined that 10 CFR 20 limits will not be exceeded with continuous rabbit operation. The rabbit system is used only a few hours per week.

Particulate effluents would be detected by the CAM. No significant particulate activity has been noted.

c. Solid Radwaste

Solid radioactive waste generated at the reactor facility is collected by the Industrial Hygiene Office and transferred (under NRC Byproduct License No. 21-00265-06) to a licensed disposal vendor. About one 55-gallon drum of waste is generated annually.

The inspector noted that the licensee has been incinerating by-product material (approximately 11 millicuries of carbon-14 and hydrogen-3 in CY 1979). The licensee stated that this practice has been conducted under Byproduct License No. 21-00265-06 for approximately seven years. The licensee further stated that the license did not specifically allow them to incinerate byproduct material, but that they had interpreted the regulations to mean that they could incinerate as long as the limits of 10 CFR 20 Appendix "B" Table II were not exceeded. This matter will be reviewed during a future inspection of Byproduct License No. 21-00265-06.

No items of noncompliance were identified.

15. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on September 12, 1980. The inspector summarized the scope and findings of the inspection.



DOW CHEMICAL U.S.A.

MIDLAND, MICHIGAN 48640

September 25, 1980

Mr. Karl R. Goller
US Nuclear Regulatory Commission
Division of Operating Reactors
Washington, DC 20555

PRINCIPAL STAFF			
DIR			
D/D			
A/D			
PEENS	7-2	SLD	
ROGERS			
ROENS		FILE	

Dear Mr. Goller:

NRC LICENSE R-108

As of August 26, 1980, H. Emmel, W. Kocher, and E. Bickel have been added to the Reactor Operations Committee for NRC License R-108 (Dow Chemical Company, TRIGA Reactor Facility, Midland, Michigan). Also at that time, T. Parsons was deleted from the Committee.

Resumes for H. Emmel, W. Kocher, and E. Bickel are enclosed for your information.

Please make the necessary changes in your records and address any future correspondence to:

J. M. Macki, Chairman
TRIGA Reactor Operations Committee
The Dow Chemical Company
1602 Building
Midland, MI 48640

LWR

L. W. Rampy, Chairman
Radiation Safety Committee
1803 Building
517/636-6260

bjd/Enclosure

cc: James G. Keppler, US Nuclear Regulatory Commission, 799 Roosevelt Road, Glenn Elyn, IL 60137

4PP

~~8010080468~~

AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

OCT

6 1980

5-49.

W. C. KOCHER

EXPERIENCE WITH RADIOISOTOPES AND IONIZING RADIATION

1. North Carolina State University
Nuclear Engineering Department 1954-1956 MS
Reactor Experience:
Operation & Maintenance/10 Kw
water-boiler
Radioisotopes:
research
2. Indiana University
Physics Department 1956-1960 PhD
Radioisotopes:
Nuclear decay schemes/cyclotron-produced materials
3. Brookhaven National Laboratory
Physics Department/Solid State Physics 1960-1962
Radioisotopes:
Moessbauer Spectroscopy
4. The Budd Company
Physical Research Laboratory 1962-1965
Radioisotopes:
Moessbauer Spectroscopy
Radiation Health Physicist
U.S. AEC Licensee
5. The Dow Chemical Company
Radiochemistry Research Laboratory 1965-1970
Radioisotopes:
Moessbauer Spectroscopy
Triga special experiments
Analytical Laboratory 1970-1975
Radioisotopes:
Moessbauer Spectroscopy
X-Ray diffraction

RESUME

Eric E. Bickel
Radiation Safety Officer
Dow Chemical USA
Industrial Hygiene Laboratory
1803 Building
Midland, MI 48640

(517)636-0885

B.S. Biological Sciences
No degree Wildlife Sciences
M.S. Health & Environmental
Sciences (Radiation Protection)

Lake Superior State College
University of Minnesota
University of Michigan

1967
1971-1972
1980

Ass't. to Rad. Safety Officer

University of Michigan

1978-1979
(6 months)

Ass't. to Health Physicist

Ford Nuclear Reactor

1979
(6 months)

Health Physics Intern

Dow Chemical USA

1979
(4 months)

Radiation Safety Officer

Dow Chemical USA

03/79 to
Present

Transcripts and references are available upon request.

RESUME

NAME: Herbert W. Emmel

ADDRESS: Dow Chemical Company
Inorganic Analysis
1602 Building
Midland, MI 48640

DATE OF BIRTH: 1937

EDUCATION: Received B.S. Degree in Chemistry from Wisconsin State
University in 1962

WORK EXPERIENCE:

- Analytical chemist, Dow Chemical Company, 1971 to present
- Senior TRIGA Reactor Operator license obtained in 1975 continued to present
- Associated with various neutron activation and inorganic elemental analysis projects from 1971 to present

FEB 20 1981

Docket No. 50-264

Dow Chemical U.S.A.
ATTN: Dr. L. W. Rumpy, Chairman
Radiation Safety Committee
1803 Building
Midland, MI 48640

Gentlemen:

It has been our policy to keep you informed of matters which are important to continued cooperation or which otherwise may be of particular interest to you. We believe this exchange of information has proved beneficial to both you and the Commission. This letter is in keeping with that policy.

A major consideration growing out of the Three Mile Island Incident, was the need for realignment of the NRC Office of Inspection and Enforcement (IE) organizational structure. Recommendations were included in NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident." The new structure, addressed in the TMI-2 action plan, is aimed at better management of the preventive inspection program, quicker and more efficient response to emergencies, and closer working relationships with the States and licensee management.

Reorganization of the NRC Regional Offices will become effective February 16, 1981. The enclosures show the new organizational structure for Region III. These charts identify supervisory and other key personnel who will be cognizant of licensed activities, State programs and other functions. There will be no resident inspector reassignments; however, in some areas supervision responsible for certain resident inspector offices has been changed.

The 24-hour NRC Region III telephone number (312-932-2500) and the Emergency Notification System remain unchanged. New telephone extensions for the staff will be provided as they become available.

~~8103090119~~ 2pp.

J-51.

You will observe from the enclosed charts that the essential elements of the new organization are (1) project management including the resident inspector offices, (2) engineering and other technical support functions including the reactor, fuel facilities and materials programs, and (3) emergency preparedness. Included on the charts are the management structure, investigative and enforcement staff, State liaison, public affairs and resident inspector program functions.

We look forward to your continued cooperation with this office, and, should you have questions regarding the subject of this letter please call me.

Sincerely,

James G. Keppler
Director

Enclosures:

1. Overall Region III
Organization Chart
2. Division of Resident
and Reactor Project
Inspection Chart
3. Division of Engineering and
Technical Inspection Chart
4. Division of Emergency
Preparedness & Operational
Support Chart

cc w/encls:

Dr. O. V. Anders,
Reactor Supervisor
J. M. Macki, Chairman
TRIGA Reactor Operations
Committee
Central Files

RIIT
[Signature]
Davis/np
2/13/81

RIII
[Signature]
Keppler

3pp

~~8103300412~~

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

July 31, 1981

IE INFORMATION NOTICE NO. 81-22: SECTION 235 AND 236 AMENDMENTS TO THE
ATOMIC ENERGY ACT OF 1954

This notice provides information on recent amendments to Chapter 18 of the Atomic Energy Act of 1954 that should be brought to the attention of all persons involved in NRC licensed activities:

"SEC. 236: Sabotage of Nuclear Facilities or Fuel--Any person who intentionally and willfully destroys or causes physical damage to, or who intentionally and willfully attempts to destroy or cause physical damage to -

"(1) any production facility or utilization facility licensed under this Act,

"(2) any nuclear waste storage facility licensed under this Act,

"(3) any nuclear fuel for such a utilization facility, or any spent nuclear fuel from such a facility,

shall be fined not more than \$10,000 or imprisoned for not more than ten years, or both."

"SEC. 235: Protection of Nuclear Inspectors--

"a. Whoever kills any person who performs any inspections which -

"(1) are related to any activity or facility licensed by the Commission, and

"(2) are carried out to satisfy requirements under this Act under any other Federal law governing the safety of utilization facilities required to be licensed under section 103 or 104b., or the safety of radioactive materials,

shall be punished as provided under sections 1111 and 1112 of title 18, United States Code. The preceding sentence shall be applicable only if such person is killed while engaged in the performance of such duties.

3pp ~~8103300412~~

"b. Whoever forcibly assaults, resists, opposes, impedes, intimidates, or interferes with any person who performs inspections as described under subsection a. of this section, while such person is engaged in such inspection duties or on account of the performance of such duties, shall be punished as provided under section 111 of title 18, United States Code...."

Section 111 of Title 18 USC sets punishment as follows:

..."Whoever, in the commission of any such acts uses a deadly or dangerous weapon, shall be fined not more than \$10,000 or imprisoned not more than ten years, or both."

Section 1111 of Title 18 USC sets punishment as follows:

..."Whoever is guilty of murder in the first degree, shall suffer death unless the jury qualifies its verdict by adding thereto "without capital punishment", in which event he shall be sentenced to imprisonment for life;

"Whoever is guilty of murder in the second degree shall be imprisoned for any term of years or for life."

Section 1112 of Title 18 USC sets punishment as follows:

..."Whoever is guilty of voluntary manslaughter, shall be imprisoned not more than ten years;

"Whoever is guilty of involuntary manslaughter, shall be fined not more than \$1,000 or imprisoned not more than three years, or both."

Known or suspected violations of Sections 235 and 236 should be reported to the NRC and FBI.

No written response to this information notice is required. If you need additional information regarding this matter, please contact the Director of the appropriate Regional Office.

Attachment:
Recently issued IE Information Notices

RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
81-21	Potential Loss of Direct Access to Ultimate Heat Sink	7/21/81	All power reactor holding an OL or CP
81-20	Test Failures of Electrical Penetration Assemblies	7/13/81	All power reactor facilities with an OL or CP
81-19	Lost Parts in Primary Coolant System	7/6/81	All power reactor facilities with an OL or CP
81-18	Excessive Radiation Exposures to the Fingers of Three Individuals Incurred During Cleaning and Wipe Testing of Radioactive Sealed Sources at a Sealed- Source Manufacturing Facility	6/23/81	Specified licensees holding Byproduct licenses
81-16	Control Rod Drive System Malfunctions	4/23/81	All BWR facilities with an OL or CP
81-15	Degradation of Automatic ECCS Actuation Capability by Isolation of Instrument Lines	4/22/81	All power reactor facilities with an OL or CP
81-14	Potential Overstress of Shafts on Fisher Series 9200 Butterfly Valves with Expandable T Rings	4/17/81	All power reactor facilities with an OL or CP
81-13	Jammed Source Rack in a Gamma Irradiator	4/14/81	Specified irradiator licensees
81-12	Guidance on Order Issued January 9, 1981 Regarding	3/31/81	All BWR facilities with an OL or CP

OL = Operating Licenses
CP = Construction Permits



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

December 31, 1974

To: All AEC Licensees

CRITERIA FOR DETERMINING ENFORCEMENT ACTION AND CATEGORIES OF NONCOMPLIANCE
WITH AEC REGULATORY REQUIREMENTS - MODIFICATIONS

On November 1, 1972, the Commission issued criteria for enforcement actions to be taken for noncompliance with its rules and with license conditions in accordance with Sections 161, 186, and 234 of the Atomic Energy Act and Subpart B of Part 2, 10 CFR. On June 5, 1973, the Commission notified licensees that categories of violation with AEC regulatory requirements had been established because the Commission and the nuclear industry recognized that the significance of violations varies in the potential for affecting the health and safety of the public, the common defense and security, and the environment.

Based on a review of the experience with the criteria for determining enforcement action and the categories of noncompliance, modifications of the use of these criteria and these categories are being made. Comments explaining the modifications are enclosed as Attachments A and B.

The changes in the criteria and categories are primarily administrative in nature and should result in a higher level of understanding of the enforcement program - and the results of the program - on the part of the public and the industry. The basic purpose of the enforcement program - enhancement of the health and safety of the public, the common defense and security, and the environment - remains the same. The long standing practice of requiring corrective action for each identified item of noncompliance (Violations) is not changed. The enforcement program continues to emphasize corrective action where necessary to assure that regulated activities meet applicable requirements and are conducted with due regard for public health and safety, common defense and security and protection of the environment.

The modifications clarify the enforcement criteria and categories of noncompliance in the areas of safeguards and environmental matters and provide more explicit definitions to aid in a better understanding of the enforcement program. These definitions make clear the applicability of the program in matters of quality assurance, management control, and systems performance. Also, because the Commission relies to a degree on reports from licensees to assure that timely corrective action is taken and to assure that the industry is notified of important matters

APPENDIX A

H 10

8007210652 16pp.

of generic interest, a reporting requirement is viewed from the enforcement standpoint to be of the same level of importance as the matter for which the report is required. As a part of the correspondence between a licensee and the AEC subsequent to an inspection, notifications will be made to a licensee of apparent failures on the part of the licensee to meet his commitments contained in his application or in correspondence to the AEC and of deviations from appropriate codes, standards or guides.

The levels of enforcement actions available to the Commission in the exercise of its regulatory responsibilities are the same as those set forth in the letter of November 1, 1972. These include written notices of violation, civil monetary penalties, and orders to "cease and desist" or for modification, suspension, or revocation of a license.

The criteria for issuance of a "Notice of Violation" are essentially unchanged.

The criteria for civil penalties have been modified to elaborate upon those situations for which civil penalties may be imposed. The amount of civil penalty in any given case, within the confines of the amounts established by the Atomic Energy Act, is determined by consideration of several factors including:

1. Potential or actual consequences associated with the item of noncompliance. This includes consideration of the categories of noncompliance.
2. Type of licensee. This includes the purpose for which licensed and the quantity, form and kind of radioactive material authorized.
3. The licensee's recent enforcement history, if applicable. This includes the nature and number of items of noncompliance, the frequency of noncompliance, whether items of noncompliance were repetitive of the same or similar requirements, promptness of corrective action, and the licensee's management of its program for assuring compliance with regulatory requirements.

The criteria clarify that repetitiveness of noncompliance or history of noncompliance is not an essential ingredient for consideration for civil penalty. In some cases of a single instance of noncompliance, a civil penalty may be the appropriate enforcement sanction.

The criteria for orders emphasize the importance of quality assurance and are broadened to include all aspects of the regulatory program. Under these criteria, an order to suspend a license or a portion thereof may be issued for authorized activities of licensees or permit holders

which are performed in such a manner as to constitute an immediate or potential threat to employees or the public; or for construction deficiencies which, if not suspended immediately, could eventually result in significant or essentially irreversible construction defects which impact on safety or which increase the potential for or the potential severity of an accident. If, for example, a quality assurance requirement for a specific construction activity is not implemented, this activity may be suspended until full compliance with the requirement is achieved.

Regulatory Operations Bulletins and Immediate Action Letters have been used not only to disseminate information but also as a means of accomplishing voluntary action on the part of licensees to inspect, report and make commitments to correct problems on a timely schedule. These two communications are recognized in these revisions. If these methods are ineffective in achieving the desired action, an order may be promptly issued requiring the action.

The enforcement record of a licensee may be a consideration in selecting the appropriate enforcement sanction in any given case. A licensee's enforcement history is evaluated in terms of distribution of items of noncompliance by importance and by the degree of repetitiveness of noncompliance with the same basic requirement. However, regardless of the history, consideration will be given to the more significant enforcement sanctions as a result of any inspection that reveals items of particular importance to safety and management.

The former system of severity categorization, which was the subject of a letter to licensees dated June 5, 1973, has been revised to place items of noncompliance with regulatory requirements (Violations) more clearly in perspective with regard to their relative significance to the public health, safety and interest and the common defense and security. As shown in Attachment B to this letter, the revised system for categorizing violations (items of noncompliance) has three levels of relative importance which are designated in descending order as (1) "violation," (2) "infraction," and (3) "deficiency," each of which is a legal violation in the statutory sense.

It should be recognized that the enforcement criteria and the categories of noncompliance apply only to situations where there is an apparent failure on the part of a licensee to meet regulatory requirements. The licensee may also be notified of deviations from commitments and appropriate codes, standards, or guides. The significance of these failures generally is judged against the actual or potential consequences resulting from the failures and from the standpoint of licensee awareness and management of his program. From the viewpoint of enforcement, a licensee failure that results in the potential for consequences is

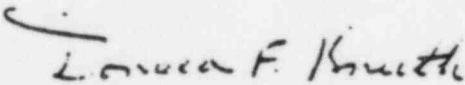
December 31, 1974

equally important with the failure that results in the consequences - both represent instances of failure of the licensee to properly perform. However, from the impact of health and safety, common defense and security, the protection of the environment, actual consequences -- when the event did occur -- and potential consequences -- when the opportunity for occurrences exists but the event did not happen -- of a item of noncompliance are quite different. In reporting the more important items of noncompliance, those items that caused or resulted in actual consequences will be differentiated from those that merely provided the potential for the consequences.

The enforcement criteria and the categories of noncompliance apply to situations where there is an apparent failure on the part of a licensee to meet regulatory requirements, commitments, and appropriate codes, standards or guides. There do occur events - such as some equipment malfunctions - at licensee facilities which are not founded in the failure of the licensee to meet requirements, commitments, and appropriate codes, standards, and guides. Such events are not included within the enforcement program.

The enforcement criteria and the categories of noncompliance have been placed in the Public Document Room, 1717 H Street, N.W., Washington, D.C., and a notice has been placed in the Federal Register concerning their availability to all persons upon request.

Sincerely,



Donald F. Knuth, Director
of Regulatory Operations

Enclosures:

- A. Criteria for Determining Enforcement Action
- B. Categories of Items of Noncompliance

CRITERIA FOR DETERMINING ENFORCEMENT ACTION

In Connection with Licensing and Regulatory Provisions
of the Atomic Energy Act of 1954, as Amended,
and Regulations and Licenses Issued Thereunder

INTRODUCTION

The purpose of the AEC enforcement program is the enhancement of the health and safety of the public, the common defense and security, and the environment. The enforcement program emphasizes corrective action, where necessary, to assure that regulated activities meet applicable requirements and are conducted with due regard for public health and safety, common defense and security and protection of the environment. Corrective action is required for each identified item of noncompliance.

Results of AEC inspections and investigations of licensed activities have shown that licensees have not in all cases complied with the regulatory requirements, and it has been necessary to take specific enforcement actions commensurate with the items of noncompliance. This document sets out the criteria for enforcement actions to be taken with respect to future noncompliance with the Atomic Energy Commission's requirements in accordance with Sections 161, 186 and 234 of the Atomic Energy Act and Subpart B of Part 2, 10 CFR.

LEVELS OF ENFORCEMENT ACTIONS AVAILABLE TO THE COMMISSION

The formal actions available to the Commission in the exercise of its enforcement responsibilities are of three basic types (notices of violation, civil penalties, and orders) which may be applicable to a specific enforcement situation.

1. Written Notices of Violation (10 CFR 2.201)

Notices of Violations are written notices to licensees, citing the apparent instances of failure to comply with regulatory requirements (Violations) which for purposes of categorization have been classified violations, infractions and deficiencies. Such items of noncompliance are generally observed or identified during investigations, inspections, or inquiries.

The same letter enclosing a Notice of Violation may also enclose a notification of apparent deviations from licensee commitments and the provisions of appropriate codes, standards or guides.

2. Civil Monetary Penalties (10 CFR 2.205)

The Commission may levy civil monetary penalties against licensees for violations, infractions or deficiencies with respect to requirements in licensing provisions of the Act or any rule, regulation,

order, or license issued thereunder. The Commission is required to issue a "notice of violation" to the person charged before instituting proceedings to impose a civil penalty.

3. Orders to Cease and Desist; and Orders for Suspension, Modification, or Revocation of a License (10 CFR 2.202 and 2.204)

The AEC has authority to issue orders to "cease and desist," and orders to suspend, modify, or revoke licenses. Such orders are ordinarily preceded by certain procedural requirements, including a written "notice of violation" to the licensee providing him with an opportunity to respond as to the corrective measures being taken. In the event the licensee fails to respond to the notice or to demonstrate that satisfactory corrective action is being taken, an order to show cause may be issued requiring the licensee to show why the particular order (either of revocation, or modification, or suspension) should not be made effective. In some instances where the health, safety, or interest of employees or the public so requires or deliberate noncompliance with the Commission's regulations is involved, the notice provision may be dispensed with and, in addition, the particular order may be made immediately effective pending further order.

In addition to proceeding by way of order, the Commission may also, pursuant to Section 232 of the Act, request the Attorney General to obtain an injunction or other court order to enjoin licensees from violating the Act or any regulation or order issued thereunder.

NOTICE OF VIOLATION - CRITERIA

Section 2.201 of 10 CFR requires that before any formal enforcement action is taken for alleged noncompliance, the AEC will serve on the licensee a written "notice of violation" except when the Director of Regulation finds that the public health, safety, or interest so requires, or that noncompliance is deliberate, the "notice of violation" may be omitted and an order to show cause issued.

Generally, a "notice of violation" may be considered sufficient enforcement action in those cases where:

- a. Items of noncompliance are readily correctable, or
- b. Items of noncompliance are not repetitive or numerous, and do not constitute an immediate or serious threat to the health and safety of the licensee's employees or the public, to the environment, or to the common defense and security, and
- c. There is no indication that appropriate corrective action will not be taken.

CIVIL MONETARY PENALTIES - CRITERIA

The Commission may levy civil monetary penalties on licensees who do not comply with the licensing provisions of the Act or any rule, regulation, order, or license issued. Generally, the type of cases that are appropriate for imposing civil penalties are those involving significant items of noncompliance and which represent a threat (but not necessarily immediate) to the health, safety, or interest of the public, or to the common defense or security, or the environment. As a matter of judgment, civil penalties may be used in lieu of license suspension when there is no immediate threat to the health and safety or the common defense and security and license suspension would deprive the licensee or his employees of their means of livelihood, or the public of essential service.

Civil penalties may be the appropriate enforcement action in cases or situations which meet one or more of the following criteria:

- a. Those cases of noncompliance with the same basic requirements that were brought to the attention of the licensee in a "notice of violation" following a previous inspection; or
- b. Those cases of noncompliance in which the licensee fails to carry out in a timely manner the corrective action the licensee stated would be taken in response to a previous written notice; or
- c. Those cases involving the deliberate failure of a person to comply with regulatory requirements;* or
- d. Those cases involving items of noncompliance in which (1) the licensee's history is one of chronic noncompliance, or (2) due to the nature and number of items of noncompliance, it is apparent that management, having been afforded an opportunity to correct previous items of noncompliance, is not conducting its licensed activities in conformance with regulatory requirements, or

* NOTE: Section 221(b) of the Atomic Energy Act requires the FBI to investigate all suspected or alleged criminal violations of the Act.

- e. Those cases where (1) an order for immediate, but temporary, suspension or to "cease and desist" is issued to remove an immediate threat to the health or safety of the licensee's employees or the public, to the environment or to the common defense and security, and (2) punitive action is deemed necessary to assure future compliance; or
- f. Those cases involving activities under construction permits where there are repeated items of noncompliance with regulatory requirements; or
- g. Those cases where an item of noncompliance resulted in or contributed to the cause or the seriousness of an accident or an incident; or
- h. Those cases involving items of noncompliance in the Violation category; or
- i. Those cases where the nature and number of items of noncompliance with the regulatory requirements identified during an inspection or an investigation demonstrate that management is not conducting its licensed activities with adequate concern for the health, safety or interest of its employees or the public or the common defense and security; or
- j. Those cases where licensees knowingly use materials which are not authorized by the license or utilize authorized materials for uses which are not authorized; or
- k. Those cases where significant matters** were not reported to the Commission in a timely manner as required by the regulatory requirements.

Civil penalties may be assessed for other cases having comparable types of items of noncompliance and situations for which the Commission deems civil penalties to be appropriate and necessary.

** Such significant matters may include, but are not limited to, exposure of personnel to doses in excess of limits, release of radioactive concentrations in effluents in excess of limits, incidents involving an attempt to commit a theft or unlawful diversion of SNM, or to commit an act of sabotage of certain facilities, failure of safety systems, emergency core cooling or other related safety systems to perform their design function, or the MUF of SNM in excess of applicable limits, or similar matters.

ORDERS - CRITERIA

The AEC has authority to issue orders to "cease and desist" or to suspend, modify, or revoke licenses. The Commission is empowered to enforce these orders and obtain any other appropriate relief by injunction from Federal district courts, if necessary. Cases involving an immediate threat to the public health and safety, or the common defense and security, require immediate steps to remove the threat and are handled by this type of action. Persons who deliberately violate, attempt to violate, or conspire to violate the Commission's regulations and orders, are, upon conviction of the violations, subject to fine up to \$5,000 and imprisonment for not more than two years (Section 223 of the Act).

In the event the licensee fails to respond to a "notice of violation" or to demonstrate that satisfactory corrective action is being taken, an order to show cause may be issued requiring the licensee to show why the particular order (either of revocation, or modification, or suspension) should not be made effective. In those instances where the health, safety, or interest of employees or the public, or the common defense and security so requires, or deliberate noncompliance with the Commission's regulations is involved, the notice provision may be dispensed with and, in addition, the particular order may be made immediately effective pending further order.

a. Orders to Cease and Desist

An order to cease and desist is ordinarily issued when a person is conducting unauthorized activities and has been notified of the need for authorization but fails to terminate the activity and other similar circumstances as appropriate.

b. Orders to Suspend a License

An order is ordinarily issued for immediate suspension of a license, or a portion thereof, as necessary to remove an immediate threat to the health, safety or interest of licensee's employees or the public, or to the common defense and security; or for noncompliance with AEC requirements relating to construction of a facility which, if not corrected immediately, could subsequently result in a significant threat to the health, safety or interest of employees or the public, or the common defense and security.

c. Order to Modify a License

An order for the modification of a license, in whole or in part, is ordinarily issued as an enforcement sanction when it is determined that a licensee's operations or activities must be limited or modified to protect the health, safety, or interest of the licensee's employees or the public, or the common defense and security.

d. Orders to Revoke a License

An order is ordinarily issued to revoke a license when:

1. The licensee's performance shows that he is not qualified to perform the activities covered by the license; or
2. Civil penalty proves to be ineffective as an enforcement action; or
3. The licensee refuses to correct items of noncompliance; or
4. A licensee does not respond to a "notice of violation"; or
5. A licensee's response to a "notice of violation" indicates inability or unwillingness to maintain compliance with regulatory requirements; or
6. Any material false statement is made in the application or in any statement of fact required under Section 182 of the Act.

e. Denial of Application for License Renewal

Denial of an application for a license renewal is ordinarily used in lieu of an order for revocation where license renewal is pending or the expiration of the license term is imminent.

f. Orders for Other Items of Noncompliance

Orders to cease and desist, or for suspension, modification or revocation of a license are ordinarily issued for other comparable types of violations, infractions or deficiencies when the Commission deems such sanctions to be appropriate and necessary.

In all cases where orders are issued to impose civil penalties, to require a licensee to "cease and desist," or to suspend, modify, or revoke a license, the person so ordered may demand a hearing under 10 CFR Part 2. The hearing will be granted prior to implementation of the order except in cases where the Commission finds that the violation is deliberate or the public health, safety, or interest requires that the proposed action be temporarily effective pending the outcome of the hearing and/or further order.

REGULATORY OPERATIONS BULLETINS - CRITERIA

A Regulatory Operations Bulletin may be issued to a class of licensees requesting specific actions as a result of safety related equipment design inadequacies, defects, operating inadequacies, malfunctions, or failures of a generic nature that have occurred at a similar facility or operation. The Bulletin will specify that licensees inspect for and/or correct the inadequacies described in the Bulletin, notify Regulatory Operations of the corrective action taken or planned, and the date when action was or will be completed. An order may be issued if the response to a Bulletin is not prompt and effective.

IMMEDIATE ACTION LETTERS - CRITERIA

A Regulatory Operations Immediate Action Letter is ordinarily issued to solicit or confirm a licensee's commitment to certain actions for investigating, reporting, controlling, and correcting situations involving defects, deviations, failures, or administrative controls, at the licensee's facility. An order may be issued if the response to an Immediate Action Letter is not prompt and effective.

CATEGORIES OF ITEMS OF NONCOMPLIANCE

The Commission and representatives of the nuclear industry have recognized that the significance of items of noncompliance with AEC requirements varies in the potential for affecting the health and safety of the public, the common defense and security, and the environment. The Commission considers that it is desirable to include in Notices of Violation an indication of the significance of each item of noncompliance cited. As a means of categorizing the items of noncompliance into an order of importance which will express their relative significance, the Commission has established three categories of items of noncompliance as follows:

Violation

A violation is an item of noncompliance of the type listed below, or an item of noncompliance (1) which has caused, contributed to or aggravated an incident of the type listed below, or (2) which has a substantial potential for causing, contributing to or aggravating such an incident or occurrence; e.g., a situation where the preventive capability or controls were removed or otherwise not employed and created a substantial potential for an incident or occurrence with actual or potential consequences of the type listed below:

- (a) Exposure of an individual in excess of the radiation dose specified in 10 CFR 20.403(b) or exposure of a group of individuals resulting in each individual receiving a radiation dose which exceeds the limits of 10 CFR 20.101 and a total dose for the group exceeding 25 man-rems.
- (b) Radiation levels in unrestricted areas which exceed 50 times the regulatory limits.
- (c) Release of radioactive materials in amounts which exceed specified limits, or concentrations of radioactive materials in effluents which exceed 50 times the regulatory limits.
- (d) Fabrication, or construction, testing, or operation of a Seismic Category I system or structure in such a manner that the safety function or integrity is lost.
- (e) Failure to function when required to perform the safety function or loss of integrity of a Seismic Category I system, or structure; or other component, system, or structure with a safety or consequences limiting function.
- (f) Exceeding a safety limit as defined in technical specifications associated with facility licenses.

- (g) Industrial sabotage of utilization or fuel facilities.
- (h) Radiation or contamination levels in excess of limits on packages or loss of confinement of radioactive materials in packages offered for shipment on a common carrier.
- (i) Diversion or theft of plutonium, uranium 233, or uranium enriched in the isotope U-235.
- (j) A breakdown in management or procedural controls as evidenced by items of noncompliance in several areas of the QA criteria and license requirements.
- (k) Other similar items of noncompliance having actual or potential consequences of the same magnitude.

Failure to report the above items as required constitutes a violation of the same importance level.

Infractions

An infraction is an item of noncompliance of the type listed below, or an item of noncompliance (1) which resulted in a reduction of preventive capability below requirements but redundant controls precluded an item of noncompliance of the violation category. or (2) which caused, contributed to or aggravated an incident of the type listed below, or (3) which has a substantial potential for causing, contributing to or aggravating such an incident or occurrence; e.g., the preventive capability or controls were removed or otherwise not employed and there was substantial potential for an accident or occurrence with actual or potential consequences of the type listed below:

- (a) Exposure of an individual or groups of individuals to radiation in excess of permissible limits but less than the values in 10 CFR 20.403.
- (b) Release of radioactive materials in concentrations or rates which exceed permissible limits but in amounts less than permissible limits.
- (c) Failure to function or loss of integrity of a Seismic Category I system or structure, or other component, system, or structure with safety or consequences limiting function during test; or failure to meet surveillance frequencies.
- (d) Fabrication, or construction, testing, or operation of a Seismic Category I system or structure in such a manner that the safety function or integrity is impaired.

- (e) Exceeding limiting conditions for operation (LCO).
- (f) Inadequate management or procedural controls.
- (g) Safety system settings less conservative than limiting safety system settings.
- (h) A quantity of SNM unaccounted for which exceeds permissible limits.
- (i) Exceeding limits or limiting conditions for operation in licenses, technical specifications, guides, codes, or standards which are imposed for the purpose of minimizing adverse environmental impact.
- (j) Other similar items of noncompliance having actual or potential consequences of the same magnitude.

Failure to report the above items as required constitutes an item of noncompliance of the same category.

Deficiency

A deficiency is an item of noncompliance in which the threat to the health, safety, or interest of the public or the common defense and security is remote; and no undue expenditure of time or resources to implement corrective action is required; and deficiencies include such items as noncompliance with records, posting, or labeling requirements which are not serious enough to amount to infractions.

Failure to report deficiencies as required constitutes an item of noncompliance of the same category.

LEGISLATIVE HISTORY OF SECTION 234 OF
THE ATOMIC ENERGY ACT OF 1954, AS AMENDED

Section 234 of the Atomic Energy Act of 1954, as amended, (Act), is the Commission authority for imposing civil penalties. Prior to the enactment in 1969 of Section 234 of the Act, the Commission's enforcement authority was limited to notices of violation and orders to cease and desist and to modify, suspend or revoke licenses.

The legislative history of Section 234 of the Act indicates that the Joint Committee on Atomic Energy was concerned that revocation or suspension of a license in some instances "may be too harsh a penalty" and "may penalize the licensee's employees through loss of income without having any significant impact on the licensee itself." S. Report 91-553, H. Report 91-691, at 9, 10. Civil penalties could be imposed "without depriving a licensee of his means of livelihood or without requiring the cessation of an authorized activity which might be of material benefit to the public." id at 10.

The Joint Committee emphasized that civil penalties would not be appropriate for all violations. For example, "where the violation is one that seriously threatens the health or safety of an employee or a member of the public" a civil penalty should not be used. id at 10. However, penalties could be imposed in cases where license suspension or revocation is not in the public interest, but in which the importance of full adherence to regulatory requirements should be emphasized by more than a notice of violation or a cease and desist order. Hearings before JCAE, AEC Omnibus Legislation - 1969, 91st Congress, 1st session, 28 (September 12, 1969).

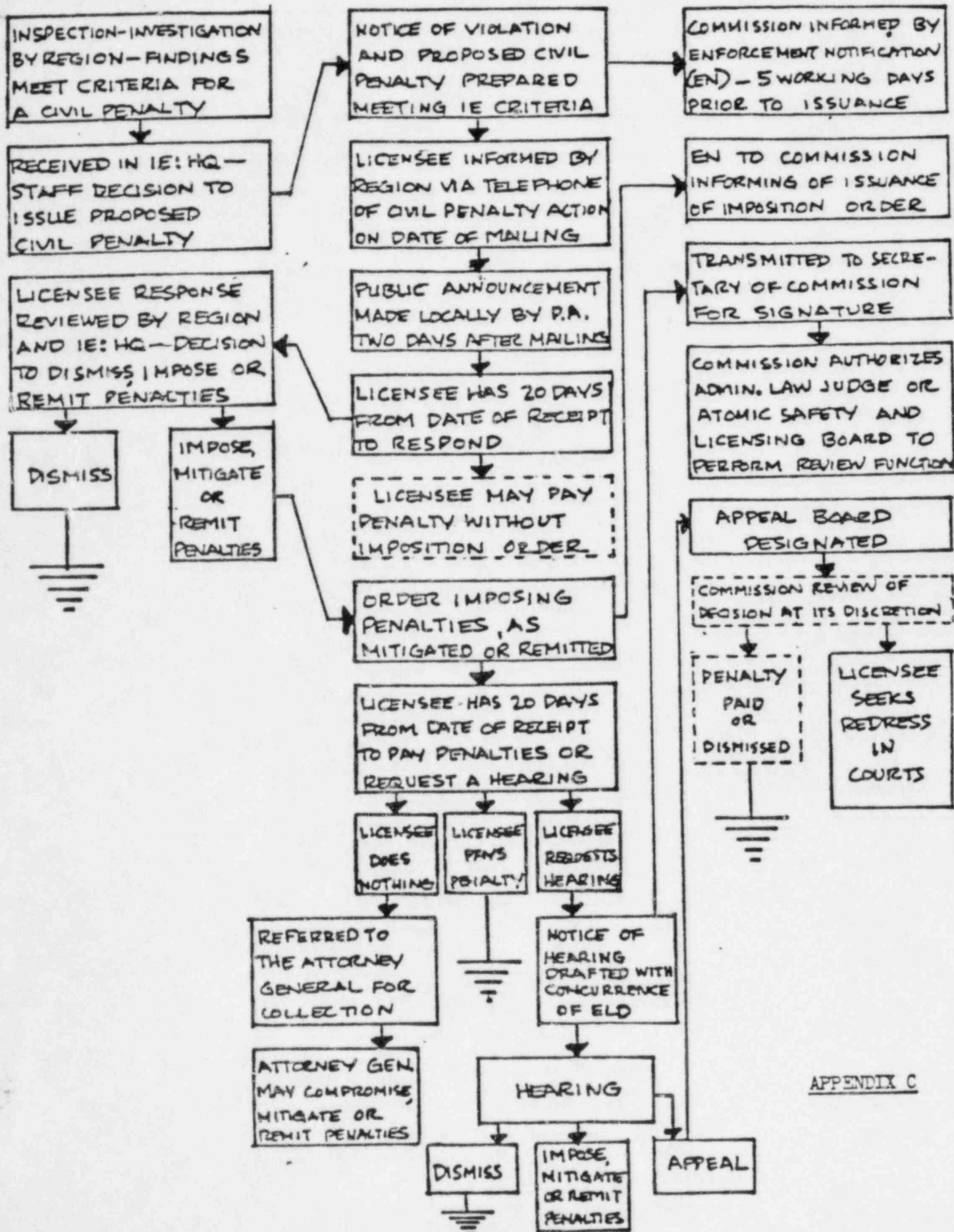
The purpose of the grant of authority to impose civil penalties is to provide the Commission with enforcement flexibility to deal with items of noncompliance of varying severity thereby "materially assist[ing] the Commission in carrying out its program to protect public health and safety and assure the common defense and security." S. Rept. 91-553, at 10. It should be noted that the Joint Committee stated that "the penalties authorized are civil only and are remedial in nature as opposed to punitive." id at 16. This statement is somewhat enigmatic since civil penalties inevitably have punitive aspects.

CIVIL PENALTY PROCESS

DECISION

PROCESS

COMMISSION INVOLVEMENT



APPENDIX C



Region II
DOW CHEMICAL U.S.A.

040-00011
40-17

January 3, 1983

MICHIGAN DIVISION
MIDLAND, MICHIGAN 48640

G. Bruchmann, Acting Chief
Radiological Health Services Division
Michigan Department of Public Health
3500 N. Logan Street
Lansing, Michigan 48909



Dear George:

This letter is a followup to the recent meeting held on December 14, 1982 between Dow and the Michigan Department of Public Health at Dow's Bay City site. This meeting was held in response to a concern expressed by the Department of Public Health at Dow's proposed consolidation plan involving the Bay City and Midland thorium storage sites. This plan was outlined in the letter dated October 21, 1982 to Mr. R. G. Page of the U.S. Nuclear Regulatory Commission (NRC) from R. A. Olson, Industrial Hygiene Services, Dow Chemical Company.

Those attending this meeting were:

Dow

R. M. Croyle, Manager of Industrial Hygiene Services, Michigan Division
R. A. Olson, Industrial Hygiene Specialist

Department of Public Health

G. N. Bruchmann, Acting Chief, Radiological Health Services Division
J. M. Hennigan, Section Chief, Nuclear Facilities and Environmental Monitoring Section

A brief review of the background information related to Dow's magnesium - thorium alloy business was presented as well as a historical review of the storage of the thorium process sludge at Dow's Bay City and Midland locations. It was pointed out that Dow has not generated any new thorium waste within the last ten years nor are there any plans in the foreseeable future to generate such material at the Michigan Division.

An extensive review of the technical data related to the Bay City thorium storage site was then reviewed. Environmental monitoring involving water, soil, external radiation, airborne particulate and sludge was presented and discussed in detail. Personnel exposure

8302040434 57P

lift

JAN 31 1983



21798

I-17

information was also reviewed. It was agreed upon as in previous discussions between Dow and the Department of Public Health, that the thorium storage at Bay City has shown minimal (if any) migration into the surrounding environment and has not posed a significant health concern to the general public.

A tour of the Bay City thorium storage site did not reveal any abnormalities or concerns from the Department of Public Health.

A review of the data available from the Midland site was presented. Environmental monitoring data involving water, soil and external radiation was discussed. The Department of Public Health's concerns over the proposed consolidation plan were then addressed. All technical questions were answered satisfactorily except for the question regarding the actual volume and activity of the thorium containing soil. It was Dow's plan to consolidate the material prior to the on-set of winter and further define the exact amount of material as this planned consolidation was taking place. Previous estimates were made based upon the best available data at the time the plan was submitted. We will further define the extent of the thorium levels prior to any move of this material. This will not occur until, at the earliest, the spring of 1983.

The NRC branch technical position relative to storage sites with less than 10 pCi/g activity was also discussed. After evaluation of the volume and activity of the thorium containing soil is made this will be discussed with the NRC and Department of Public Health if applicable.

The question concerning Dow's long term plan for the storage of thorium at Dow's Bay City site was again discussed. Previous communications from Dow to the Department of Public Health (December 14, 1977 E. O. Gooding to D. E. VanFarowe and March 23, 1979 K. Harmon to D. E. VanFarowe) outlined Dow's alternatives and position. The various alternatives were reviewed and the essence of our discussions were as follows.

1. Continue long term temporary storage at present site with appropriate monitoring program (status quo).

Dow does not feel that immediate action is necessary for final disposition of this material. We do, however, understand the Department of Public Health's desire for final disposition of this material.

2. Ship material to a NRC approved nuclear waste burial site.

This alternative is not economically feasible to Dow nor do we feel that, due to the low radioactivity, this is a good use of the limited burial sites approved by the NRC for disposal.

3. Bury material at existing location with appropriate state and NRC approvals.

Due to Michigan's Public Act 113, this option would not be feasible unless a variance was applied for and granted.

4. Leave material in place until State of Michigan has developed an approved burial site.

This alternative can neither be viewed as favorable nor unfavorable due to the uncertainty at this time of the State of Michigan's plans for an approved burial site. We cannot discount this as a long term alternative. However, when this burial site has been developed an unfavorable economic picture could occur similar to that of the currently approved NRC sites.

5. Transport material to an interested party to recover thorium value.

This option was pursued extensively in 1978 with no success. The interest in recovered thorium is extremely low.

6. Ship material to another Dow location outside the State of Michigan for proper disposal or storage.

Although this option may be attractive to the Department of Public Health, it is unlikely that the receiving state or the NRC would be amenable to this plan.

7. Reduce volume via separation technique and then dispose.

The amount of thorium stored at the Bay City site is about 70,000 pounds. However, included with this material is soil, magnesium slag, foundry sand and miscellaneous material. The historical problem with final disposition of this material has been the large volume. As outlined at our meeting, Dow will evaluate different modes for reducing this volume and evaluate the technical and economic feasibility of these options. Some potential methods and ideas include mechanical separation via particle size, separation by radioactivity, separation by density, separation via magnetism and chemical leaching of the thorium.

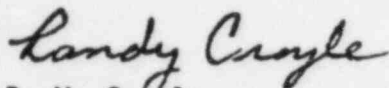
There is no guarantee that an acceptable method can be found however, we are willing to pursue this avenue to evaluate this option. The activity level at which no further licensing or restrictions are needed remains to be determined. Both the NRC and Department of Public Health will be consulted.

In summation, prior to any consolidation of the thorium material located at the Midland site, better definition of its volume and activity will be made. Both the NRC and Department of Public Health will be consulted and notified of Dow's recommended course of action.

In addition, Dow will evaluate the technical and economic feasibility of reducing the volume of stored material at the Bay City site.

The meeting was very productive and opened up constructive communication channels. We hope that this will continue as we pursue the various options for Dow's thorium disposition. If there are any questions, please feel free to give me a call.

Sincerely,



R. M. Croyle
Manager
Industrial Hygiene Services
474 Building
Phone: (517)636-0609

srm

cc: D. T. Buzzelli, Dow Chemical Company, Midland, MI
R. A. Olson, Dow Chemical Company, Midland, MI
J. M. Hennigan, Michigan Department of Public Health, Lansing, MI
R. G. Page, NRC, Washington, D.C.
B. Kosla, NRC, Washington, D.C.
M. Schumacker, NRC, Glenn Ellyn, IL

ADDITIONAL DISTRIBUTION

B. G. Caldwell, 47 Building

M. Makulski, 47 Building

L. Weimer, Bay City, Michigan

L. W. Rampy, 1803 Building

T. W. Parsons, 1803 Building

J. A. Tomke, 628 Building

J. Ulrich, 47 Building

JAN 23 1981

Docket No. 50-264

81-01

Dow Chemical U.S.A.
ATTN: Dr. Larry W. Rampy
Chairman, Radiation
Safety Committee
1803 Building
Midland, MI 48640

Gentlemen:

This refers to the routine safety inspection conducted by Mr. K. R. Ridgway of this office on January 12-14, 1981, of activities at Dow TRIGA Reactor authorized by NRC Operating License No. R-108 and to the discussion of our findings with Dr. O. U. Anders, Reactor Supervisor, and other staff members at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty-five days of the date of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

H 25

8103090100 2pp.

Dow Chemical U.S.A.

- 2 -

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

R. F. Heishman, Chief
Reactor Operations and
Nuclear Support Branch

Enclosure: IE Inspection
Report No. 50-264/81-01

cc w/encl:
Dr. Anders, Reactor Supervisor
J. M. Macki, Building Supervisor
Central Files
Reproduction Unit NRC 20b
PDR
NSIC
TIC

RIII
RR
Ridgway/np
1/22/81

RIII
RR
Boyd
for 1/23/81

RIII
RA
Heishman
1/23/81

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-264/81-01

Docket No. 50-264

License No. R-108

Licensee: Dow Chemical, U.S.A.
1602 Building
Midland, MI 48640

Facility Name: Dow Nuclear Research Reactor

Inspection Conducted: January 12-14, 1981

Inspector: *K. R. Ridgway*
K. R. Ridgway

1/22/81

Approved By: *D. C. Boyd*
D. C. Boyd, Chief
Projects Section 4

1/23/81

Inspection Summary

Inspection on January 12-14, 1981 (Report No. 50-264/81-01)

Areas Inspected: Routine, unannounced safety inspection of records; logs and organization; review and audit functions; requalification training; procedures; surveillance and maintenance; experiments; fuel handling activities; and followup action relative to IE Circulars and previous noncompliance items. The inspection involved a total of 15 inspector-hours onsite by one NRC inspector including 0 inspector-hours onsite during off-shifts.

Results: No items of noncompliance were identified in the seven areas inspected.

8103090105 5pp.

DETAILS

1. Persons Contacted

- *O. Anders, Reactor Supervisor
- *K. Kelly, Senior Reactor Operator
- *J. Macki, Building Supervisor
- *E. Bickel, Industrial Hygienist
- *C. Kocher, Operator Trainee
- *T. Quinn, Senior Reactor Operator

*Indicates those present at the exit interview.

2. Organization, Logs and Records

The facility organization was reviewed and verified to be consistent with the Technical Specifications and/or Hazards Summary Report. The minimum staffing requirements were verified to be present during reactor operations, and fuel handling or refueling operations.

The reactor logs and records were reviewed to verify that:

- a. Required entries were made.
- b. Significant problems or incidents were documented.
- c. The facility was being maintained properly.
- d. Records were available for inspection.

There have been no organizational changes since the last inspection.^{1/}
The licensee expects to have three operators ready for licensing in March, 1981.

No items of noncompliance or deviations were identified.

3. Reviews and Audits

The licensee's review and audit program records were examined by the inspector to verify that:

- a. Reviews of facility changes, operating and maintenance procedures, design changes, and unreviewed experiments had been conducted by a safety review committee as required by Technical Specifications or Hazards Summary Report.
- b. That the review committee and/or subcommittees were composed of qualified members and that quorum requirements and frequency of meetings had been met.
- c. Required safety audits had been conducted in accordance with Technical Specification requirements and that any identified problems were resolved.

^{1/} IE Report No. 50-264/80-03²

The license and Technical Specifications do not require any internal audits, however, the licensee does conduct an annual review of safety practices in the laboratory.

No items of noncompliance were identified.

4. Requalification Training

The inspector reviewed procedures, logs and training records; and interviewed personnel to verify that the requalification training program was being carried out in conformance with the facility's approved plan and NRC regulations. Annual requalification examinations had been conducted in January, 1980.

No items of noncompliance were identified.

5. Procedures

The inspector reviewed the licensee's procedures to determine if procedures were issued, reviewed, changed or updated, and approved in accordance with Technical Specifications and HSR requirements.

This review also verified:

- a. That procedure content was adequate to safely operate, refuel and maintain the facility.
- b. That responsibilities were clearly defined.
- c. That required checklists and forms were used.

The inspector determined that the required procedures were available and the contents of the procedures were adequate.

No items of noncompliance were identified.

6. Surveillance

The inspector reviewed procedures, surveillance test schedules and test records and discussed the surveillance program with responsible personnel to verify:

- a. That when necessary, procedures were available and adequate to perform the tests.
- b. That tests were completed within the required time schedule.
- c. Test records were available.

No items of noncompliance were identified.

7. Experiments

The inspector verified by reviewing experiment records and other reactor logs that:

- a. Experiments were conducted using approved procedures and under approved reactor conditions.
- b. New experiments or changes in experiments were properly reviewed and approved.
- c. The experiments did not involve an unreviewed safety question i.e., 10 CFR 50.59.
- d. Experiments involving potential hazards or reactivity change were identified in procedures.
- e. Reactivity limits were not or could not have been exceeded during the experiment.

No items of noncompliance were identified.

8. Refueling

The facility fuel handling program was reviewed by the inspector. The review included the verification of approved procedures for fuel handling and the technical adequacy of them in the areas of radiation protection, criticality safety, Technical Specification and security plan requirements. The inspector determined by records review and discussions with personnel that fuel handling operations and startup tests were carried out in conformance to the licensee's procedures.

No items of noncompliance were identified.

9. IE Circular Followup

For the IE Circulars listed below, the inspector verified that the Circular was received by the licensee management, that a review for applicability was performed, and that if the circular was applicable to the facility, appropriate corrective actions were taken or were scheduled to be taken.

- a. IEC 79-08, Attempted Extortion-Low Enriched Uranium.
- b. IEC 80-02, Nuclear Power Plant Staff Work Hours.
- c. IEC 80-14, Radioactive Contamination of Plant Demineralized Water System and Resultant Internal Contamination of Personnel.

10. Followup on Items of Noncompliance

The inspector reviewed the licensee's corrective action taken in response to a previous noncompliance where a monthly surveillance test

had been missed.^{2/} The licensee has established a scheduling board to avoid this type of oversight. We have no further questions on this matter.

11. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on January 14, 1981 and summarized the scope and findings of the inspection.

^{2/} IE Report No. 50-264/79-03



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

JAN 13 1982

Docket No. 50-264
Docket No. 70-1487

Dow Chemical U.S.A.
ATTN: Dr. Larry W. Rumpy
Chairman, Radiation
Safety Committee
1803 Building
Midland, MI 48640

Gentlemen:

This refers to the routine safety inspection conducted by Mr. K. R. Ridgway of this office on December 7-10, 1981, of activities at Dow TRIGA Reactor authorized by NRC Operating License No. R-108 and License No. SNM-1451 and to the discussion of our findings with you and other staff members at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractors) believe to be exempt from disclosure under 10 CFR 9.5(a)(4), it is necessary that you (a) notify this office by telephone within ten (10) days from the date of this letter of your intention to file a request for withholding; and (b) submit within twenty-five (25) days from the date of this letter a written application to this office to withhold such information. If your receipt of this letter has been delayed such that less than seven (7) days are available for your review,

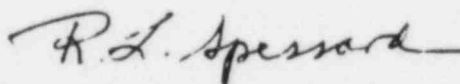
H 24

8201290522 2pp.

please notify this office promptly so that a new due date may be established. Consistent with Section 2.790(b)(1), any such application must be accompanied by an affidavit executed by the owner of the information which identifies the document or part sought to be withheld, and which contains a full statement of the reasons which are the bases for the claim that the information should be withheld from public disclosure. This section further requires the statement to address with specificity the considerations listed in 10 CFR 2.790(b)(4). The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified periods noted above, a copy of this letter and the enclosed inspection report will be placed in the Public Document Room.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,



R. L. Spessard, Director
Division of Resident and
Project Inspection

Enclosure: Inspection
Report No. 50-264/81-02 and
No. 70-1487/81-01

cc w/encl:
Dr. C. W. Kocher, Reactor
Supervisor
Mr. J. M. Macki, Chairman
DMB/Document Control Desk (RIDS)

RIII

Boyd/jp
1/6/82

RIII

Knop for

RIII

Greedy

RIII

Greger
1/13

RIII

Spessard
1/11/82

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-264/81-02; 70-1487/81-01

Docket Nos. 50-264; 70-1487

License Nos. R-108; SNM-1451

Licensee: Dow Chemical, U.S.A.
1602 Building
Midland, MI 48640

Facility Name: Dow TRIGA Reactor

Inspection Conducted: December 7 - 10, 1981

Inspector: *K.R. Ridgway*
K. R. Ridgway

1/8/82

Approved By: *D.C. Boyd*
D. C. Boyd, Chief
Projects Section 1A

1-11-82

Inspection Summary

Inspection on December 7 - 10, 1981 (Report Nos. 50-264/81-02; 70-1487/81-01)

Areas Inspected: Routine, unannounced inspection of records, logs and organization; review and audit functions; requalification training; procedures; surveillance and maintenance; experiments; radiation protection program; radwaste management program; security program and implementation; material control and accountability; emergency plan; and followup relative to IE Circulars, Licensee Event Reports and Open Inspection Items. This inspection involved a total of 45 inspector-hours (32 onsite) by one NRC inspector including 0 inspector-hours onsite during offshifts.

Results: No items of noncompliance were identified in the areas inspected.

~~8201290525~~ 8pp.

DETAILS

1. Persons Contacted

- *L. Rampy, Chairman, Radiation Safety Committee
- *O. Anders, Reactor Supervisor
- *J. Maki, Building Supervisor
- *K. Kelly, Assistant Reactor Supervisor
- *C. Kocher, Assistant Reactor Supervisor
- *T. Quinn, Senior Reactor Operator
- *T. Parsons, Radiation Safety Officer
- R. Kolesar, Director, Medical Department
- D. Ducommon, M. D., Medical Department
- M. Graham, Director of Nursing, Medical Department
- W. Heitzig, Manager, Security
- L. McJames, Supervisor, Emergency Services
- R. Olson, Industrial Hygienist
- *G. Dixon, Industrial Hygienist
- C. Vaughn, Industrial Hygienist

*Indicates those present at the exit interview.

2. General

The inspection, which began at 8:30 a.m. on December 7, 1981, with a walk through at the facility to observe existing conditions was conducted to examine the overall safety and security program. No problems were noted.

The Dow TRIGA Reactor is a part of the Analytical Laboratory and is used almost exclusively as a neutron source for activation analysis. It is used almost every day and in most cases, several times per day. The total operating time per week is about 2.5 hours and on the average about 300 irradiations are made each month.

3. Organization, Logs and Records

The facility organization was reviewed and verified to be consistent with the Technical Specifications and/or Hazards Summary Report. The minimum staffing requirements were verified to be present during reactor operation, and fuel handling or refueling operations.

The reactor logs and records were reviewed to verify that:

- a. Required entries were made.
- b. Significant problems or incidents were documented.
- c. The facility was being maintained properly.

- d. Records were available for inspection.

The following organizational changes had been made during 1981.

- e. Dr. L. Rampy was elected Chairman of the Radiation Safety Committee on August 25, 1980, replacing Dr. R. Langner.
- f. Dr. C. Kocher replaced Dr. O. Anders as Reactor Supervisor.
- g. C. Kocher, T. Hiller, and D. Krueger received NRC Senior Operator Licenses on April 14, 1981.
- h. T. Parsons replaced E. Bickel as Radiation Safety Officer.

No items of noncompliance or deviations were identified.

4. Reviews and Audits

The licensee's review and audit program records were examined by the inspector to verify that:

- a. Reviews of facility changes, operating and maintenance procedures, design changes, and unreviewed experiments had been conducted by a safety review committee as required by Technical Specifications or Hazards Summary Report.
- b. That the review committee and/or subcommittees were composed of qualified members and that quorum requirements and frequency of meetings had been met.
- c. Required safety audits had been conducted in accordance with Technical Specification requirements and that any identified problems were resolved.

The license and technical specifications do not require any internal audits, however, the Industrial Hygiene Laboratory reviews radiation safety practices annually at the Reactor Facility.

No items of noncompliance were identified.

5. Requalification Training

The inspector reviewed procedures, logs and training records; and interviewed personnel to verify that the requalification training program was being carried out in conformance with the facility's approved plan and NRC regulations. Five requalification examinations had been conducted in January 1981.

No items of noncompliance were identified.

6. Procedures

The inspector reviewed the licensee's procedures to determine if procedures were issued, reviewed, changed or updated, and approved in accordance with Technical Specifications and HSR requirements.

This review also verified:

- a. That procedure content was adequate to safely operate, refuel and maintain the facility.
- b. That responsibilities were clearly defined.
- c. That required checklists and forms were used.

The inspector determined that the required procedures were available and the contents of the procedures were adequate.

The licensee had several minor changes to the Operating Procedure Manual in early 1981 and had started an overall revision on the manual. The inspector suggested several additions and changes that would better define control of procedures, dates of revisions or ROC approvals, who could make various kinds of changes and better documentation that all changes and other pertinent information had been reviewed by all concerned persons.

No items of noncompliance were identified.

7. Surveillance

The inspector reviewed procedures, surveillance test schedules and test records and discussed the surveillance program with responsible personnel to verify:

- a. That when necessary, procedures were available and adequate to perform the tests.
- b. That tests were completed within the required time schedule.
- c. Test records were available.

The inspector noted that in some cases where maintenance work had been carried out on safety instrumentation, there was incomplete documentation of what, if any, checks or calibrations were required before restarting the reactor. The licensee indicated a check sheet to document the evaluation and work would be developed.

No items of noncompliance were identified.

8. Experiments

The inspector verified by reviewing experiment records and other reactor logs that:

- a. Experiments were conducted using approved procedures and under approved reactor conditions.
- b. New experiments or changes in experiments were properly reviewed and approved.
- c. The experiments did not involve an unreviewed safety question, i.e., 10 CFR 50.59.
- d. Experiments involving potential hazards or reactivity change were identified in procedures.
- e. Reactivity limits were not or could not have been exceeded during the experiment.

No items of noncompliance were identified.

9. Radiation Control

The inspector reviewed records, interviewed personnel, and made observations and independent surveys to verify that radiation controls were being carried out in accordance with the license and NRC regulations. The areas covered were:

- a. Posting and labeling of restricted areas and radioactive materials.
- b. Control of irradiated samples.
- c. Calibration of radiation detection instruments.
- d. Required periodic dose and contamination surveys.
- e. Exposure records of personnel.
- f. Personnel training.

The inspector noted that two doserate meters assigned to the Reactor Laboratory had not been calibrated since July 1981. The Dow Radiation Protection Manual states "ionization chamber instruments are calibrated quarterly". A licensee representative stated that he assumed quarterly to mean calendar quarterly and that the instruments were to be calibrated before the end of the fourth quarter 1981. The licensee agreed to change the quarterly frequency definition in the manual to agree with the standard quarterly definition of 92 days plus 24 days.

The licensee makes monthly contamination wipe tests and radiation dose rate surveys in several laboratory rooms in the 1602 Building including the reactor room and laboratory rooms surrounding it. The dose rate surveys for September and October 1981 had been overlooked. The survey for November showed no change from the last survey in August 1981. The license and technical specifications do not require radiation control procedures and the frequency of the above surveys is not specified in the Radiation Protection Manual. The licensee stated that the surveys would be conducted monthly in the future.

No items of noncompliance were identified.

11. Radioactive Effluents

The licensee had not released any liquid radioactive wastes since the last radwaste inspection in September 1980.

The facility has no gaseous effluent monitor since calculations in the Safety Analysis Report determined that 10 CFR 20 offsite limits would not be exceeded with continuous pneumatic sample operation. The pneumatic sampler is used only a few hours per week. The air in the reactor room is continuously sampled for particulate activity with local alarm and remote alarm in the Security Dispatcher's Control Station.

No items of noncompliance were identified.

12. Security Program

On October 20, 1978, the licensee applied for and NRR approved License Amendment No. 4, dated June 28, 1979. The amendment concerned minor changes to the Physical Security Plan. The inspector reviewed the approved plan and determined that the requirements of the plan were being carried out in the areas of:

- Physical Protection
- Security Organization and Training
- Access Control
- Alarms Systems
- Keys, Locks, and Hardware
- Communications
- Surveillance
- Security Procedures
- Security Program Review
- Protection Against Sabotage

The licensee had recently conducted a key inventory with laboratory personnel assigned to operations who had access to laboratory rooms connected with the reactor room.

No items of noncompliance were identified.

13. Material Control and Accounting

The inspector determined that the licensee has not received or shipped any fuel or SNM since the last material control inspection in November 1978. All fuel is being used on a current basis and excess reactivity is determined daily when the reactor is in use. The inspector reviewed these records and visually counted the fuel. Records of the last annual fuel inventory completed in December 1980, documented in the Reactor Log Book, and the required NRC-42 submittals were reviewed.

The plutonium-238 sources carried under License SNM-1451 were inventoried and records of the semi-annual leak test were reviewed.

No items of noncompliance were identified.

14. Emergency Plan

The inspector reviewed the TRIGA Reactor Emergency Plan which had been updated and approved by the RSC on August 28, 1980. Changes to the plan were only to meet formal recommendations in Regulatory Guide 2.6, dated January 1979.

The inspector reviewed records and interviewed personnel from the Analytical Laboratory, Industrial Hygiene Laboratory, Medical Department and Plant Security to determine that commitments made in the plan were being met; that emergency systems and equipment such as alarms, radiation detection equipment, respiratory protection devices and other supplies were available; and that the required tests and drills had been conducted.

No items of noncompliance were identified.

15. Licensee Event Reports Followup

Through direct observations, discussions with licensee personnel, and review of records, the following event report was reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications.

On March 24, 1981, the licensee notified Region III that their Constant Air Monitor (CAM) was found to be leaking air around an "O" ring seal which allowed part of the sampled air to bypass the filter thus degrading the sensitivity of the monitor. To correct the problem a new

"O" ring was installed, the vacuum relief valve was relocated to permit checking the "O" ring seal, the filter locking device adjusted, and procedures developed to check the seal daily during the reactor startup check.

16. IE Circular Followup

For the IE Circular listed below, the inspector verified that the Circular was received by the licensee management, that a review for applicability was performed, and that if the circular was applicable to the facility, appropriate corrective actions were taken or were scheduled to be taken.

IEC 81-02 - Performance of NRC-Licensed Individuals While on Duty.

17. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on December 10, 1981, and summarized the scope and findings of the inspection.

SEP 16 1980

Docket No. 50-264

80-01

Dow Chemical U.S.A.
ATTN: Dr. R. R. Langner
Chairman, Radiation
Safety Committee
Building 1603
Midland, MI 48640

Gentlemen:

This refers to the routine inspection conducted by Miss R. J. Greer of this office on August 28-29, 1980, of activities at Dow Nuclear Research Reactor authorized by NRC License No. R-108 and to the discussion of our findings with Mr. O. Anders and others of your staff at the conclusion of this inspection, and to the discussion by telephone with Mr. K. Kelly on September 3, 1980.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection. However, based on a conversation on September 3, 1980 between Mr. K. Kelly of your staff and Miss R. Greer of this office, it is our understanding that you apparently did not conduct quarterly evacuation drills during the last quarter, 1978 and the first quarter, 1979 (Paragraph 6 of enclosed inspection report). It is also our understanding that you have developed a Reminder Board which lists requirements and other functions to be conducted on annual, semiannual, quarterly and monthly schedules, including quarterly evacuation drills. This board is intended to insure that drills as well as other functions are completed as required.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

423

801106027L 2pp

Dow Chemical U.S.A.

- 2 -

SEP 16 1980

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

A. B. Davis, Chief
Fuel Facility and
Materials Safety Branch

Enclosure: IE Inspection
Report No. 50-264/80-01

cc w/encl:
Central Files
Reproduction Unit NRC 20b
PDR
NSIC
TIC

RIII *EX*
Greer/np
9/12/80

RIII *asf*
Papertello

RIII *CJP*
Davis
fr 9/16/80

RIII
Ridgway

RIII
Boyd

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-264/80-01

Docket No. 50-264

License No. R-108

Licensee: Dow Chemical, U.S.A.
1803 Building
Midland, MI 48640

Facility Name: Dow Nuclear Research Reactor

Inspection At: Dow Site

Inspection Conducted: August 28-29, 1980

Inspector: *H. G. Greer*
R. J. Greer

Approved By: *A. B. Januska for*
C. J. Paperiello, Acting Chief
Environmental and Special
Projects Section

9/15/80

9/15/80

Inspection Summary

Inspection on August 28-29, 1980 (Report No. 50-264/80-01)

Areas Inspected: Routine, unannounced inspection of Emergency Planning, including: a review of the Emergency Plan; an examination of coordination with support personnel; an examination of facilities and equipment, and medical arrangements, and an examination of drills and training. The inspection involved ten inspector-hours on site by one NRC inspector.

Results: No apparent items of noncompliance or deviations were identified.

8011060274 3pp.

DETAILS

1. Persons Contacted

*O. Anders, Reactor Supervisor.
*K. Kelly, Senior Reactor Operator
*J. Maki, Building Supervisor
*E. Bickel, Industrial Hygienist
T. Parsons, Industrial Hygienist
S. Humbyrd, Operations Supervisor, Plant Protection and Security
D. Ducommon, M. D. Medical Department
M. Graham, R. N. Director of Nursing, Medical Department

*Indicates those present at the exit interview.

2. Emergency Plan

The licensee's Emergency Plan is dated April 15, 1977. The inspector reviewed it and determined that it contained the major elements of emergency preparedness discussed in Regulatory Guide 2.6, "Emergency Planning for Research Reactors," dated January, 1979.

3. Coordination with Support Agencies

The inspector contacted members of the licensee's Health Physics and Industrial Hygiene, Plant Protection, and Medical Departments and discussed the arrangements made to provide assistance in the event of an emergency. Discussions with representatives of those departments showed that there is close coordination between them and reactor personnel. The Plant Protection Department would provide security as well as ambulance services to reactor personnel as necessary. The Department maintains an emergency vehicle which contains emergency supplies and survey instrumentation. The licensee's Medical Department provides medical support and has prepared a procedure for the treatment of contaminated injuries.

No items of noncompliance or deviations were noted.

4. Facilities and Equipment

The inspector examined the licensee's emergency equipment, radiation survey monitoring equipment, and supplied air respiratory equipment for maintenance and operability. The equipment appeared to be maintained in a ready state. Survey instrumentation examined was operable and calibrated on the required frequency. The reactor room is equipped with a continuous air monitor and area radiation monitor which have audible and visual alarms and are monitored by the reactor operators and at the plant protection communications center. These alarms were checked and found to be operable. The licensee has just developed two

emergency kits which contain various items of emergency supplies and clothing. These kits are to be taken from the facility in the event of an evacuation.

No items of noncompliance or deviations were identified.

5. Medical Arrangements

Injured personnel needing medical assistance would be transported to the Medical Department by a Plant Protection Department vehicle. The inspector and licensee representatives visited the Medical Department and found that it contained facilities for the decontamination of injured personnel, and provisions for retaining contaminated liquids. At least one physician in the Medical Department has been to a course detailing the treatment of radiation accident victims. Medical personnel were familiar with the treatment of contaminated injuries and had developed specific procedures for this treatment.

No items of noncompliance or deviations were identified.

6. Drills and Training

Licensee employees are retrained in the Emergency Plan during the requalification training for their operator's licenses. The inspector reviewed records of the training and selected examinations for content. No problems were noted. The licensee stated that support personnel and plant protection and fire are trained at least annually by the Industrial Hygiene Department. The inspector reviewed records of this training and verified that it was conducted.

The licensee conducts quarterly evacuation drills of his facility. The inspector reviewed drill records since 1977 and noted that drills for the last quarter of 1978 and the first quarter of 1979 were apparently not conducted. Licensee personnel stated that it is likely that these drills were overlooked; however, drills were conducted on a quarterly frequency from the first quarter 1979 to present. Licensee personnel stated that a reminder board has been developed to track requirements and other functions which are to be conducted on specific frequencies such as annual, semiannual, quarterly, and monthly. Evacuation drills are included under the quarterly requirement. The inspector examined this reminder board and verified that it should prevent the inadvertant omission of quarterly drills. No other problems were identified.

7. Exit Interview

The inspector met with licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on August 29, 1980. The inspector summarized the purpose and scope of the inspection and its findings. An additional exit interview was conducted by telephone on September 3, 1980, with a licensee representative.

OCT 22 1979

Docket No. 50-264

79-02

Dow Chemical U.S.A.

ATTN: Dr. R. R. Langner

Radiation Safety Committee

Building 1603

Midland, TX 79701

Gentlemen:

This refers to the inspection conducted by Mr. J. W. Hiatt of this office on October 2 and 3, 1979, of activities at the TRIGA Reactor Facility authorized by NRC Operating License No. R-108 and to the discussion of our findings with Messrs. Anders, Gill, and Parsons at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in noncompliance with NRC requirements, as described in the enclosed Appendix A.

This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office within twenty days of your receipt of this notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter, the enclosures, and your response to this letter will be placed in the NRC's

H 21

79-2050073 2pp.

OCT 22 1979

Public Document Room, except as follows. If the enclosures contain information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

A. B. Davis, Chief
Fuel Facility and Materials
Safety Branch

Enclosures:

1. Appendix A, Notice of Violation
2. IE Inspection Report No. 50-264/79-02

cc w/encls:

Central Files
Reproduction Unit NRC 20b
PDR
NSIC
TIC

OFFICE	RIII <i>WZJ</i>	RIII <i>WZJ</i>	RIII <i>WZJ</i>	RIII <i>WZJ</i>		
SURNAME	Hiatt/sr <i>10/22</i>	Fisher <i>10/22</i>	Davis <i>WZJ</i>	Brown <i>WZJ</i>		
DATE	10/19/79		10/22/79			

Appendix A

NOTICE OF VIOLATION

Dow Chemical U.S.A. - TRIGA Reactor

Docket No. 50-264

Based on the inspection conducted on October 2 and 3, 1979, **it appears that certain of your activities were in noncompliance with NRC requirements, as noted below. The item is an infraction.**

Technical Specification I.4 requires that the Reactor Operations Committee will meet at least quarterly.

Contrary to the above, the Reactor Operations Committee failed to meet during the second calendar quarter of 1979.

~~942050076~~ /p.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-264/79-02

Docket No. 50-264

License No. R-108

Licensee: Dow Chemical U.S.A.
1803 Building
Midland, MI 48640

Facility Name: TRIGA Reactor

Inspection At: TRIGA Reactor Site, Midland, MI

Inspection Conducted: October 2-3, 1979

Inspector: *W. L. Fisher*
J. W. Hiatt

10/22/79

Approved By: *W. L. Fisher*
W. L. Fisher, Chief
Fuel Facility Projects and
Radiation Support Section

10/22/79

Inspection Summary

Inspection on October 2-3, 1979 (Report No. 50-264/79-02)

Areas Inspected: Routine, unannounced inspection of radiation protection and radwaste management program, including: qualifications; audits; training; procedures; instruments and equipment; exposure control; posting, labeling, and control; surveys; notifications and reports; records of effluents; effluent control instruments; solid radwaste; and previous commitments. The inspection involved 11 inspector-hours on site by one NRC inspector.

Results: Of the thirteen areas inspected, no items of noncompliance or deviations were found in twelve areas; one apparent item of noncompliance was found in one area (infraction - failure of Reactor Operations Committee to meet quarterly - Paragraph 5).

79-2050315 lpp.

DETAILS

1. Persons Contacted

*O. Anders, Reactor Supervisor
*H. Gill, Research Manager, 1602 Building
*T. Parsons, Health Physicist
T. Quinn, Reactor Operator

*Denotes those present at exit interview.

2. General

This inspection, which began with visual observation of facilities and equipment, posting, labeling, and access controls at 8:15 a.m. on October 2, 1979, was conducted to examine the routine operational radiation protection and radwaste management program. During this and subsequent tours, the inspector used a licensee survey meter to survey the reactor area. The highest radiation level, about 5 mR/hr, was found near a source storage area. At full power (100 kW) the radiation level at waist level above the reactor pool was about 4 mR/hr. The inspector also observed sample loading, irradiation, and removal from the reactor; no problems were noted.

3. Previous Inspection Findings

The following commitment listed in IE Report No. 50-264/78-02 was reviewed:

(Closed) Formalizing written procedures for the calibration of the continuous air monitor and the water radiation monitor. The licensee had formalized the above procedures (Paragraph 7).

4. Organization

There were no changes in the reactor staff since the last radiation protection inspection (May 1978). The staff consists of the reactor supervisor, three full time operators, and two qualified "backup" operators.

The reactor health physicist is a member of the Industrial Hygiene Office. In September 1979 the Reactor Operations Committee confirmed the appointment of Mr. T. Parsons as the reactor health physicist. Mr. Parsons, who has an M. S. degree in Health Physics, replaces Mr. D. Barsten, who left in September 1978. In the interim (between September 1978 and September 1979) the reactor health physics position was rotated between other health physicists in the Industrial Hygiene Office.

No problems were noted.

5. Licensee Audits

Minutes of Reactor Operations Committee (ROC) and Radiation Safety Committee (RSC) meetings held since May 1978 were reviewed. Membership requirements for both committees and meeting frequencies for the RSC were as required in technical specifications I.2 and I.5. However, the inspector noted that the ROC failed to meet in the second quarter of 1979. This is an item of noncompliance.

6. Training

Outside of the reactor staff, no other individuals frequent the reactor area. The reactor staff receives radiation protection training during annual requalification. Training required by 10 CFR 19.12 was also received.

No items of noncompliance were identified.

7. Radiation Protection Procedures

As a result of a previous inspection,^{1/} the licensee formalized procedures for calibrating the area radiation monitor (required by T.S. I.7.a) and the water radiation monitor. These procedures and the continuous air monitor calibration procedure (required by T.S. I.7.a) are contained in the "TRIGA Operations Manual." The inspector reviewed the procedures; no problems were found.

No items of noncompliance were identified.

8. Instruments and Equipment

a. Portable Survey Instruments

Operable and calibrated instruments capable of detecting beta and gamma radiation and neutrons were available at the reactor. Additional instrumentation is available from the Industrial Hygiene Office if needed. Records reviewed showed that the instruments are calibrated either quarterly (ionization type and neutron meters) or annually (Geiger-Mueller type meters).

b. Area Radiation Monitors

In May 1978 use of a new area radiation monitor (ARM) was approved by the Reactor Operations Committee.^{2/} Records reviewed indicate that the monitor was calibrated in May 1978 and March and September 1979 (T.S. G.3 requires an annual frequency). During a facility tour the inspector verified that the monitor's audible alarm was functional.

1/ IE Inspection Report No. 50-264/78-02.

2/ Ibid.

c. Continuous Air Monitor (CAM)

The inspector reviewed records of calibrations and alarm setpoint checks since May 1978 and noted that the frequency was as required by T.S. G.3. The inspector also verified that an audible alarm was initiated when the setpoint was exceeded.

No items of noncompliance were identified in the above areas.

9. Exposure Control

a. External Exposure

The vendor's film badge reports were reviewed for the period May 1978 to date. The greatest whole body and extremity doses received in CY 1978 were 60 mrem and 220 mrem, respectively. No measurable whole body dose has been received in CY 1979 to date; the highest extremity dose has been about 180 mrem.

Self-reading pocket dosimeters are available if needed. The inspector noted that the dosimeters had not been calibrated by the licensee. The licensee stated that calibration would be considered. This item will be reviewed further during a future inspection.

b. Internal Exposure

The licensee has no routine bioassay or air sampling programs and relies on the CAM, contamination swipe tests, and pool water analysis to define any problem areas. Records of the above indicators were reviewed; no problems were noted. The inspector noted that pool water was last analyzed for tritium in 1971. The licensee stated that the current tritium concentration will be analyzed. This item will be reviewed further during a future inspection.

No items of noncompliance were identified in the above areas.

10. Posting and Labeling

The licensee's compliance with posting and labeling requirements specified in 10 CFR 19.11 and 10 CFR 20.203 were reviewed. No problems were noted.

11. Materials

Radioactive material received at the Dow complex is surveyed by the Industrial Hygiene Office. The licensee stated that no material has been received under the TRIGA license since the last radiation protection inspection (May 1978). Radioactive Material produced in the TRIGA is used within the facility.

No items of noncompliance were identified.

12. Surveys

As a result of a new program instituted by the Industrial Hygiene Office, in July 1979 the reactor staff began conducting and documenting contamination and area surveys monthly. The Industrial Hygiene Office makes quarterly contamination surveys of the facility. Results of surveys performed by both groups were reviewed. Only low-level, short-lived contamination was noted.

No items of noncompliance were identified.

13. Notification and Reports

A review of records and discussions with licensee representatives indicated no problems in the licensee's compliance with 10 CFR 19 and 10 CFR 20 requirements.

No items of noncompliance or deviations were identified.

14. Radwaste Management

a. Liquid Radwaste

The only liquid released from the facility is domestic water used to rinse demineralizer resin during resin changes (performed about once per 18 months). The water is drained into a drum, stored for several months, gamma scanned, and, if no activity is detected, released to the sanitary sewer. The licensee stated that no activity had been detected. About ten to twenty gallons of distilled water are added to the reactor pool each week to replace water lost by evaporation. Liquid samples are evaporated and the planchets disposed as solid waste.

b. Gaseous Radwaste

The licensee has no gaseous effluent monitor. At the inspector's request the licensee calculated that the amount of Ar-41 released annually would be less than 0.1 curie. The inspector reviewed this calculation and concurred with the method used and the results.

Any potential particulate effluents would be detected by the CAM. No significant particulate activity was noted.

c. Solid Radwaste

Solid radwaste (gloves, paper, etc.) is collected by the Industrial Hygiene Office and transferred (under NRC Byproduct Material License No. 21-00265-06) to a licensed disposal agency. About one 55-gallon drum of waste is generated annually by the reactor facility.

The licensee does not plan to submit a quality assurance program satisfying the criteria specified in 10 CFR 71, Appendix E. The licensee was aware that, until such a program is submitted, no shipments of greater than Type A quantities of radioactive material can be made.

No items of noncompliance were identified in the above areas.

15. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 3, 1979. The inspector summarized the scope and findings of the inspection. In response to certain items discussed by the inspector, the licensee:

- a. Acknowledged the noncompliance with Reactor Operations Committee meeting frequency (Paragraph 5).
- b. Stated that the calibration of self-reading pocket dosimeters would be considered (Paragraph 9.a).
- c. Stated that the evaluation of tritium concentration in reactor pool water would be considered (Paragraph 9.b).
- d. Acknowledged the inspector's comments concerning their lack of a quality assurance program satisfying the criteria specified in 10 CFR 71, Appendix E (Paragraph 14.c).

GOVERNMENT ACCOUNTABILITY PROJECT

1555 Connecticut Avenue, N.W., Suite 202
Washington, D.C. 20036

April 9, 1985

(202) 232-8550

Freedom of Information Officer
United States
Nuclear Regulatory Commission
Washington, D.C. 20555

FREEDOM OF INFORMATION
ACT REQUEST

FOIA-85-259

rec'd 4/11/85

Dear Freedom of Information Officer,

Under the provisions of the Freedom of Information Act, 5 U.S.C. 552, the Government Accountability Project (GAP) is requesting copies of all information on record at the NRC and/or AEC which indicates, and/or has indicated, that the Dow Chemical Company of Midland, Michigan was not in compliance with any law and/or regulation and/or guideline(s) administered by the NRC/AEC and/or any other state or federal agency.

GAP requests that any fees be waived. As you know, the Act (5 U.S.C. 552(a)(4)(a)) permits you to waive any fees when the release of the information is considered as "primarily benefiting the public." GAP believes that this request fits that category.

For any documents or portions of documents that you deny due to a specific exemption under the Act, please provide an index itemizing and describing the documents or portions of documents withheld. The index should provide a detailed justification of your grounds for claiming each exemption, explaining why each exemption is relevant to the document or portion of document withheld.

GAP would appreciate your handling this request as quickly as possible, and we look forward to hearing from you within ten (10) days, as the Act stipulates.

Sincerely,

Steve Kohn
Staff Attorney

Richard Condit
Staff Associate

3490
8507290641 LP

GOVERNMENT ACCOUNTABILITY PROJECT

1555 Connecticut Avenue, N.W., Suite 202
Washington, D.C. 20036

April 9, 1985

(202) 232-8550

Freedom of Information Officer
United States
Nuclear Regulatory Commission
Washington, D.C. 20555

FREEDOM OF INFORMATION
ACT REQUEST

FOIA-85-261

rec'd 4/11/85

Dear Freedom of Information Officer,

Under the provisions of the Freedom of Information Act, 5 U.S.C. 552, the Government Accountability Project (GAP) is requesting copies of any information compiled by and/or for the NRC/AEC regarding the Dow Chemical Company of Midland, Michigan which was compiled in order to comply with, and/or to determine the need to comply with, 10 CFR Parts 19, 20, 30, 31, 32, 33, 34, 35, 40, 51.4, 51.5, 51.6, 51.7, 70, 170, and/or 40 CFR Parts 1500.6.

GAP requests that any fees be waived. As you know, the Act (5 U.S.C. 552(a)(4)(a)) permits you to waive any fees when the release of the information is considered as "primarily benefiting the public." GAP believes that this request fits that category.

For any documents or portions of documents that you deny due to a specific exemption under the Act, please provide an index itemizing and describing the documents or portions of documents withheld. The index should provide a detailed justification of your grounds for claiming each exemption, explaining why each exemption is relevant to the document or portion of document withheld.

GAP would appreciate your handling this request as quickly as possible, and we look forward to hearing from you within ten (10) days, as the Act stipulates.

Sincerely,

Steve Kohn
Staff Attorney

Richard Condit
Staff Associate

8508010090 JP

AUG 3 1984

Gentlemen:

In an effort to reduce the flow of unnecessary paperwork, we are instituting a new system of acknowledging receipt of licensee correspondence concerning items of noncompliance found during an inspection by using a preprinted form rather than a letter. This practice will begin on August 20, 1984. Should our review of your correspondence require additional information or clarification, you will be informed by this office within 20 working days of the receipt of your correspondence.

NRC Region III plans to send copies of the acknowledgement forms to the Public Document Room (PDR) but not to others on the Region III distribution list for the particular facility. However, all licensee correspondence and any required NRC letters relative to that correspondence will be provided to the PDR and persons on the Region III distribution list for the particular facility.

If you have any questions concerning this practice, please contact me (312-790-5677).

Sincerely,
Original signed by
James G. Keppler
James G. Keppler
Regional Administrator

~~8408070401~~ 4pp

J-62

RIII P.../sv 07/30/84	RIII Roy 7/31	RIII Mind 7/31/84	RIII Spessard 7/31	RIII Berson	RIII Davis	RIII Keppler
-----------------------------	---------------------	-------------------------	--------------------------	----------------	---------------	-----------------

8408070401

ATTACHMENT 1

1E31



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

Date _____

REF: Facility _____

Inspection Report No(s). _____

OR License No(s). _____

Thank you for your letter dated _____,
informing us of the steps you have taken to correct the non-
compliance which we brought to your attention in our letter
dated _____. We will examine these matters during
a future inspection.

Licensee

114. 647

LETTER SENT TO THE FOLLOWING:

American Electric Power Service 50-315/316 -
Corporation
Indiana and Michigan Electric Company

The Cleveland Electric Illuminating
Company 50-440/441

Commonwealth Edison Company (50-456/457; 50-454/455; 50-313/
50-254/265, 50-10, 50-237/249; 314

Consumers Power Company (50-329/330 50-295/304
50-155/255

Dairyland Power Cooperative 50-409

The Detroit Edison Company 50-341

Illinois Power Company 50-461/462

Iowa Electric Light and Power
Company 50-331

Northern States Power Company 50-282/306; 50-263

Public Service Indiana 50-546/547

Toledo Edison Company 50-346

Union Electric Company 50-483

Wisconsin Electric Power Company 50-266/301

Wisconsin Public Service
Corporation 50-305

Battelle Columbus Laboratories 70-6/70-8

Combustion Engineering, Inc. 70-36

General Electric Company 73-1

Kerr-McGee Chemical Corporation 70-925; 70-1193; STA-583

Purdue University 50-182; 50-152

Ohio State University (50-150
70-801; 70-994

University of Illinois 50-151; 50-356

University of Michigan 50-2

LETTER SENT TO THE FOLLOWING:

University of Missouri ⁵⁰⁻¹⁸⁶ (70-270; 70-1077; 70-301)
University of Wisconsin 50-154
Westinghouse Electric Corporation 50-87
The Curators of the University of Missouri - Rolla ⁵⁰⁻¹³³ (70-201; 70-1077)
Iowa State University 50-114
Michigan State University 50-294
Dow Chemical U.S.A. 50-264
Abbott Laboratories 12-421-3
Amersham Corp. 12-12836-1
Honeywell, Inc. 50B-971
Mallinckrodt, Inc. 24-4204-1
Minnesota Mining & Manufacturing Co. 22-57-6
Monsanto Research Corp. 50M-561
Allied Chemical Company 50B-524
of Allied Corporation
Advanced Medical Systems, Inc. 34-19089-1

50-264
Dow Chemical U.S.A.

DEC 21 1984

Gentlemen:

Please reference my letter dated August 3, 1984, informing you of a new system for acknowledging receipt of licensee correspondence concerning items of noncompliance found during an inspection.

In an effort to further reduce unnecessary paperwork, use of the preprinted acknowledgement letter referenced in my August 3 letter will be discontinued as of January 1, 1985. If your response is found to be adequate, no acknowledgement letter will be issued. If your response requires additional information or clarification, you will be informed by this office. All licensee correspondence and NRC letters relative to that correspondence will continue to be provided to the PDR and persons on the Region III distribution list for the particular facility.

If you have any questions concerning this practice, please contact me at (312) 790-5677.

Sincerely,

James G. Keppler
Regional Administrator

bcc: DMB

J-63

RIII	RIII RIII	RIII	RIII	RIII	RIII	RIII
<i>[Signature]</i>	<i>[Signature]</i> Roy <i>[Signature]</i> Lind	<i>[Signature]</i> Norrellius	<i>[Signature]</i> Spessard	<i>[Signature]</i> Berson	<i>[Signature]</i> Davis	<i>[Signature]</i> Keppler
Perkins/sv	12/30 12/20	12/20/84	12/30	12/21	12/21	12/21/84

~~8501300674~~ 3pp

IE-31

LETTER SENT TO THE FOLLOWING:

American Electric Power Service
Corporation
Indiana and Michigan Electric Company

The Cleveland Electric Illuminating
Company

Commonwealth Edison Company

Consumers Power Company

Dairyland Power Cooperative

The Detroit Edison Company

Illinois Power Company

Iowa Electric Light and Power
Company

Northern States Power Company

Public Service Indiana

Toledo Edison Company

Union Electric Company

Wisconsin Electric Power Company

Wisconsin Public Service
Corporation

Battelle Columbus Laboratories

Combustion Engineering, Inc.

General Electric Company

Kerr-McGee Chemical Corporation

Purdue University

Ohio State University

University of Illinois

University of Michigan

LETTER SENT TO THE FOLLOWING:

University of Missouri

University of Wisconsin

Westinghouse Electric Corporation

The Curators of the University
of Missouri - Rolla

Iowa State University

Michigan State University

Dow Chemical U.S.A.

Abbott Laboratories

Amersham Corp.

Honeywell, Inc.

Mallinckrodt, Inc.

Minnesota Mining & Manufacturing Co.

Monsanto Research Corp.

Allied Chemical Company
of Allied Corporation

Advanced Medical Systems, Inc.

AUG 3 1984

Gentlemen:

In an effort to reduce the flow of unnecessary paperwork, we are instituting a new system of acknowledging receipt of licensee correspondence concerning items of noncompliance found during an inspection by using a preprinted form rather than a letter. This practice will begin on August 20, 1984. Should our review of your correspondence require additional information or clarification, you will be informed by this office within 20 working days of the receipt of your correspondence.

NRC Region III plans to send copies of the acknowledgement forms to the Public Document Room (PDR) but not to others on the Region III distribution list for the particular facility. However, all licensee correspondence and any required NRC letters relative to that correspondence will be provided to the PDR and persons on the Region III distribution list for the particular facility.

If you have any questions concerning this practice, please contact me (312-790-5677).

Sincerely,

Original signed by
James G. Keppler

James G. Keppler
Regional Administrator

~~8408070401~~ 4pp

RIII
P.../sv
07/30/84

RIII
Roy
7/31

RIII
Mind
7/31/84

RIII
7/31/84

RIII
Spessard
7/31

RIII
Berson

RIII
Davis

RIII
Keppler

ATTACHMENT 1

1E31



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

Date _____

REF: Facility _____

Inspection Report No(s). _____

OR License No(s). _____

Thank you for your letter dated _____,
informing us of the steps you have taken to correct the non-
compliance which we brought to your attention in our letter
dated _____. We will examine these matters during
a future inspection.

Licensee

HP-697

LETTER SENT TO THE FOLLOWING:

American Electric Power Service 50-315/316 -
Corporation
Indiana and Michigan Electric Company

The Cleveland Electric Illuminating
Company 50-440/441

Commonwealth Edison Company (50-456/457; 50-454/455; 50-313/
50-254/265; 50-10; 50-237/249; 314

Consumers Power Company (50-324/330 50-295/304
50-155/255

Dairyland Power Cooperative 50-409

The Detroit Edison Company 50-341

Illinois Power Company 50-461/462

Iowa Electric Light and Power
Company 50-331

Northern States Power Company 50-282/306, 50-263

Public Service Indiana 50-546/547

Toledo Edison Company 50-346

Union Electric Company 50-483

Wisconsin Electric Power Company 50-264/301

Wisconsin Public Service
Corporation 50-305

Battelle Columbus Laboratories 70-6/70-8

Combustion Engineering, Inc. 70-36

General Electric Company 70-1

Kerr-McGee Chemical Corporation 70-925; 70-1193; STA-583

Purdue University 50-182; 50-152

Ohio State University (50-150
70-801; 70-994

University of Illinois 50-151; 50-356

University of Michigan 50-2

LETTER SENT TO THE FOLLOWING:

University of Missouri ⁵⁰⁻¹⁸⁶ (70-270; 70-1077; 70-301)
University of Wisconsin 50-154
Westinghouse Electric Corporation 50-87
The Curators of the University ⁵⁰⁻¹³³ (70-201; 70-1077)
of Missouri - Rolla
Iowa State University 50-114
Michigan State University 50-294
Dow Chemical U.S.A. 50-264
Abbott Laboratories 12-621-3
Amersham Corp. 12-12836-1
Honeywell, Inc. SUB-971
Mallinckrodt, Inc. 24-4204-1
Minnesota Mining & Manufacturing Co. 22-57-6
Monsanto Research Corp. SNM-567
Allied Chemical Company ^{SUB-524}
of Allied Corporation
Advanced Medical Systems, Inc. 34-19089-1

APR 11 1985

Docket No. 50-264 ✓

Mr. L. W. Rampy, Chairman
Radiation Safety Committee
Dow Chemical Company
1803 Building
Midland, MI 48640

Dear Mr. Rampy:

This is to acknowledge receipt of your letter dated March 20, 1985, which transmitted changes to the "Dow TRIGA Research Reactor Security Plan," under the provisions of 10 CFR 50.54(p).

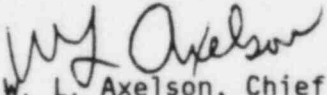
We have reviewed the changes and have determined that they are consistent with the provisions of 10 CFR 50.54(p) and are therefore acceptable.

Future revision to the "Dow TRIGA Research Reactor Security Plan" that do not decrease the effectiveness of the plan should be submitted to:

Mr. James Keppler
Regional Administrator
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Eilyn, IL 60137

Your letter contains Proprietary Information of a type specified in 10 CFR 2.790(d) and is being protected against unauthorized disclosure.

Sincerely,


W. L. Axelson, Chief
Nuclear Materials Safety
and Safeguards Branch

cc: See Attached List

bcc: NMSS/SGFF
NRR/SSPB
SG Case File: 0500026401WA
SG Inspector File: Christoffer
SG Reviewer File:
NRR Docket File

RIII

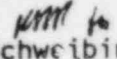
RIII

RIII

RIII


4/10/85


Creed


Schweibinz
4/10/85


Axelson

~~8504160086~~

J-65

2 pp.

Dow Chemical Company

Mayor Robert D. Goodenough
202 Ashman
Midland, MI 48640

Mr. C. W. Kocher
Reactor Supervisor
Dow Chemical Company
1602 Building
Midland, MI 48640

Office of the Governor
Room 1 - Capitol Building
Lansing, MI 48913

Lee E. Jager, P.E., Chief
Environmental and Occupational
Health Services Administration
Michigan Department of Health
3500 N. Logan Street
P. O. Box 30035
Lansing, MI 48909

Mr. Hugh L. Thompson, Director
U.S. Nuclear Reactor Commission
Office of Nuclear Reactor Regulation
Division of Licensing
Washington, D.C. 20555

Lil

DEC 30 1981

The Dow Chemical Company
ATTN: L. W. Rampy, Ph. D.
Manager, Industrial
Hygiene Laboratory
1803 Building
Midland, MI. 48640

License No. 21-00265-06

Gentlemen:

This refers to the routine safety inspection conducted by Messrs. W. J. Slawinski, and J. R. Madera of this office on December 14-15, 1981 of activities authorized by NRC Byproduct Material License No. 21-00265-06 and to the discussion of our findings with you and other members of your staff at the conclusion of the inspection.

The inspection was an examination of activities conducted under your license as they relate to radiation safety and to compliance with the Commission's rules and regulations and with the conditions of your license. The inspection consisted of a selective examination of procedures and representative records, observations, independent measurements, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

D. J. Sreniawski

D. J. Sreniawski, Chief
Materials Radiation Protection
Section 2

cc: DMB/Document Control Desk (RIDS)

K-4

RIII
W. D.
Slawinski
12/29/81

RIII
W. D. for
Madera

RIII
DJS
Sreniawski
12/30/81

~~8201110468~~ 1p.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

INSPECTION REPORT NO. 81-01
The Dew Chemical Co.
(Licensee name/address)
1803 Building
Midland, Mi. 48640
Telephone No: (517) 636-0860

Attached

- () Appendix A
() Appendix B
() Appendix C
() Memo

License No. 21-00265-06 Last amendment & date: #39, 10-14-81

Docket No. 030-04783

Category: EIA & Priority: IV, as of last amendment.

Inspection date(s): 12/14 & 12/15/81 Type of inspection: Reinspection - Announced

SUMMARY OF FINDINGS AND ACTION

- ☒ No noncompliance, clear 591 () Noncompliance, 591 issued
() Noncompliance, Appendix A () Regional action () Bq action
() Action on previous n/c, App B () Supplemental info, App C

RECOMMENDATIONS

See basis in Appendix C or attached memo.

() Change Category to: _____ () Change Priority to: _____

09 Next inspection date: 12/84

PERSONS CONTACTED
(NAME AND TITLE)

* L.W. Rampy, Ph.D. - Mgr, Industrial Hygiene
* Tracy Parsons - RSO
* Richard Olson - RSO
Charles Vaughn - Industrial Hygiene

* Indicates those attending management meetings

Inspector: Wayne J. Slawinski / John L. Maden 12-21-81
(signature) (date signed)
Approved: D. J. Szwedowski 12-24-81
(signature) (date signed)

8310110147 19pp.

MC 1005
4/77

INDUSTRIAL - ACADEMIC INSPECTION REPORTLicensee: The Dow Chemical Co. Lic. No. 21-00265-06 Amendment No. 39Date of Inspection: 12/14 & 12/15/811. INSPECTION HISTORY

- a. Items of noncompliance or safety items noted during last inspection

conducted on 12/6/76 Yes ☒ No ☐

- b. Requirement

Corrected

Not Corrected

1. 10 CFR 20.105(b)(1)

- c. If any items of noncompliance or safety items noted during the last inspection were not corrected, explain:

2. ORGANIZATION

- a. Organizational structure as described in application or letter

Dated _____, Or See Below

- b. List primary licensee contact:
- Tracy Parsons
- Telephone No.:
- 636-3205
- (17)

- c. Comment:

L.W. Rempel, Ph.D. - Mgr, Industrial Hygiene and
Radiation Safety Committee ChairmanTracy Parsons - RSO (primary)Richard Olson - RSO (secondary)

3. SUMMARY OF LICENSED PROGRAM (Kind of program, number of people, rate of use or

quantities on hand, places and frequency of use, type, quantity and use as

authorized).

Two primary uses of BPM:

1. Sealed sources (Am-241, Cs-137, Co-60, Po-210)

used primarily in industrial gauging devices

2. BPM (Z-1-83) primarily in liquid form for RAD

of pesticides and herbicides, bio-routing and tracer

studies in plants and small animals, Majority

of work with C-14 and H-3, (over)

Category and priority of this license is appropriate: Yes ☒ No ☐

If "No" state new Category Priority .

4. INTERNAL AUDITS OR INSPECTIONS

a. Required by L/C or application: Yes ☒ No ☐ If "Yes":

1) By whom RSO's - Primarily by T. Parsons

2) Frequency - Quarterly Announced: ☒ Unannounced: ☐

3) Scope Review of lab procedures and records, includes

wipe tests of all current use areas and review

of general radiation safety practices with principal

4) Records maintained: Yes ☒ No ☐

5) Records reviewed: Yes ☐ No ☐

6) Period Reviewed:

b. Comment (responsibility of auditor or committee, management control):

1. Audits also performed by Jim Vigil (RSO for

Dow in Indianapolis Ind). Typically conducted once

every year or two.

2. Rad Safety Committee meets semi-annually to

discuss any safety related problems.

Members listed in license application dated 6-14-78.
12/76

5. TRAINING RETRAINING AND INSTRUCTION TO WORKERS

a. Training program specified in L/C or application: Yes ☒ No ☐

b. If training program is required, describe scope of program: Training
given by Industrial Hygiene Dept. grouped into
3 categories (class I, II & III). Class I training
composed of instruction as per 19.12. Class II

c. Retraining required: Yes ☒ No ☐

If "Yes" is retraining: Complete ☐ Incomplete ☒

1) Are tests and/or examinations required: Yes ☐ No ☒

2) If "Yes" are records available: Yes ☐ No ☐

3) Reviewed test results: Yes ☐ No ☐

4) Period reviewed:

5) Comment (per cent completed, test results, etc.): Periodic safety
meetings are held to review and update
safety practices. However, nothing formal.

d. Training provided, but not covered above: continued from # b above...

... training composed of 4 hr class covering licensee
safety procedures, applicable NRC Regs and general
rad safety practices. Class II given to all
lab personnel. Class III training is given to
Nuclear Service personnel and those who may handle large...

e. Instructions to workers in accord with 10CFR 19.12: Yes ☒ No ☐

... quantities of loose BPM. Class III training
seldom given.

Incinerator personnel are also given a
1-2 hr instruction class dealing specifically
with incineration of BPM & DOW.

Certificates maintained on all trained persons 12/76.

6. RADIOLOGICAL PROTECTION PROCEDURES

a. Operating and emergency procedures

- 1) Required by L/C or application: Yes ☒ No ☐
- 2) Provided, but not required by L/C or application: Yes ☐ No ☐
- 3) Procedures reviewed: Yes ☒ No ☐
- 4) Appeared Adequate: Yes ☒ No ☐
- 5) Comments (personnel's understanding of procedures): _____

b. Changes in procedures since last inspection: Yes ☐ No ☒

- 1) Were changes authorized: Yes ☐ No ☐
- 2) Comments: _____

7. INSTRUMENTATION

- ### a. Type(s) of radiation survey instruments on hand as per L/C, application ^{or} equivalent: Yes ☒ No ☐

- 1) If "No" list changes: _____

~ 40 survey instruments available

b. Capability of radiation survey instruments adequate for program:

Yes ☒ No ☐

c. Calibration of instruments required: Yes ☒ No ☐

d. If "Yes" instruments calibrated in accord with requirements:

Yes ☒ No ☐

e. Comment: Reviewed instrument calibration records
for 8 meters (1979 - Present)

8. MATERIALS

a. Radioactive material secured to prevent unauthorized removal from:

1) Restricted area: Yes ☒ No ☐

2) Unrestricted area (20.207): Yes ☒ No ☐

b. Method of control appears adequate: Yes ☒ No ☐

c. Comment: _____

9. FACILITIES

a. Facilities described in letter or application: Yes ☐ No ☒

b. Facilities inspected: Yes ☒ No ☐

c. Comment: _____
Toured 1832 Building - Lab #s 128,
127, 172, 200 and 171

Also inspected Industrial gauge storage
area (building #492) and incinerator
area (building #703).

10. POSTING AND LABELING

a. Posting and labeling in accord with 10CFR 20.203: Yes ☒ No ☐

b. Comment: _____

11. RECEIPT AND TRANSFER OF MATERIAL

a. Procedures for picking up and receiving packages (10CFR 20.205 (b)(c)):

Yes ☒ No ☐

1) Incoming shipments monitored: Yes ☒ No ☐

2) Records of monitoring maintained (10CFR 20.401(b)): Yes ☒ No ☐

3) Records reviewed by NRC inspector: Yes ☒ No ☐

4) Period reviewed: Sporadic record sampling for 1980 + 1981

b. Procedures for opening packages (10CFR 20.205(d)): Yes ☒ No ☐

c. Comment: _____

All pkgs received, in other than sealed
source form, are wipe tested for contamination.

Direct radiation surveys performed in
accordance with 20.205.

All sealed sources (ie gauges) received
@ 492 storage building.

All other materials received @ 1712 building
and then picked up and wipe tested
by lab personnel.

d. Records of receipt and transfer of material available (30.51(a); 40.61(a);

70.51(b)(1)): Yes ☒ No ☐

1) If "Yes" review of records was made by inspector: Yes ☒ No ☐

2) Period Reviewed: Various records for 1979 - Present

3) Comments: _____

e. Packages on hand meet labelling requirements (49CFR 173.399):

Yes ☐ No ☐

Comments: _____

N/A

f. Reports to commission required by L/C or regulation submitted:

Yes ☐ No ☐

Comments: _____

N/A

12. PERSONNEL RADIATION PROTECTION - EXTERNAL

a. Film or TLD badge supplier R.S. Landauer

b. Badge exchange frequency Monthly

c. Reports reviewed by T. Parsons

e. Records reviewed for period 11/76 to 10/14/81 by NRC inspector

f. NRC forms or equivalent

1) NRC-4 (20.102(b)): Yes ☒ No ☐ Complete: Yes ☐ No ☒

2) NRC-5 (20.401(a)): Yes ☒ No ☐ Complete: Yes ☒ No ☐

Maximum whole body quarterly exposure: 640 mrem

Maximum extremity quarterly exposure: 1360 mrem

3) Comment: 640 mrem exposure due to clean
up operation @ Dresden.

g. Pocket dosimeters used: Yes _____ No ☒

1) Type used: _____

2) Frequency of recharging: _____

3) Frequency of reading: _____

4) Comment: _____

h. Direct radiation surveys of restricted and/or unrestricted areas being made:

Yes ☒ No _____

1) Records of surveys being maintained: Yes ☒ No _____

2) Records of surveys reviewed: Yes ☒ No _____

3) Period reviewed: 1979 - Present

4) Comments: Frequency of lab surveys
dictated by isotope, quantity and use.
See licensee application dated 6-14-78

13. PERSONNEL RADIATION PROTECTION - INTERNAL

a. Potential for exposure of individuals to airborne radioactive materials

exists: Yes ☒ No _____ (minimal)

1) If "Yes" does program for monitoring and control exist: Yes ☒ No _____

2) Program for monitoring and control appears adequate: Yes ☒ No _____

b. Comments: Typically μCi amounts of C-14 or H-3
used ☒ per experiment. Occasionally mCi quantities ^{used}
Hoods available and used routinely.

c. Respiratory protection program required by L/C or application:

Yes _____ No ☒

1) If "Yes" were respiratory protection procedures reviewed:

Yes _____ No _____

2) Respiratory protection procedures appear adequate: Yes _____ No _____

3) Comments: _____

d. Bioassay program required: Yes _____ No ☒

1) If "Yes" was bioassay program reviewed: Yes _____ No _____

2) Bioassay program appear adequate: Yes _____ No _____

3) Comments: _____

e. Smears and air samples

1) Monitoring for airborne radioactivity is conducted (20.103):

Yes _____ No ☒

a. Records of monitoring reviewed: Yes _____ No _____

b. Period reviewed: _____

c. Records of monitoring appears adequate: Yes _____ No _____

2) Smear surveys being conducted (20.201, b): Yes ☒ No _____

a. Records of smear surveys reviewed: Yes ☒ No _____

b. Period reviewed: Sampling of records from 1979 - Present

c. Records appeared adequate: Yes ☒ No _____

3) Comments: Smear survey frequency dependent
upon isotope, quantity used, and purpose
of use. See 6-14-78 applic.

14. LEAK TESTS

- a. Leak tests required: Yes ☒ No ☐
- b. If "Yes" leak tests conducted: Yes ☒ No ☐
- c. Records of leak tests maintained: Yes ☒ No ☐
- d. Leak tests records reviewed: Yes ☒ No ☐
- e. Period reviewed: 1979 - Present
- f. Records of leak tests appear adequate: Yes ☒ No ☐
- g. Comments: Reviewed leak test results for 25
sealed sources, selected at random
Licensee possesses > 300 sealed sources
of various activities and kinds.

15. RADIOACTIVE EFFLUENT CONTROL AND WASTE DISPOSAL

- a. Byproduct material released to atmosphere and/or sewer (20.106 and 20.303):
Yes ☒ No ☐ BPM incineration
- b. Records of releases or radioactive effluents maintained (20.401):
Yes ☒ No ☐
- * 1) Period reviewed: 1979, 1980 & 1981 to present
- 2) Records appear adequate: Yes ☒ No ☐
- c. Solid waste disposal method: Incinerate or transfer to NECO.
- 1) Records of disposal maintained (30.51): Yes ☒ No ☐
- 2) Surveys of waste prior to disposal made (20.201): Yes ☒ No ☐
- ** 3) Period reviewed: NECO shipments in 1979 - Present
- 4) Records of surveys appear adequate (20.401): Yes ☒ No ☐
- d. Comments: * Licensee incinerates only C-14 & H-3 and materials
possibly contaminated with such. Waste to be incinerated
packaged and quantified by senior investigator
(over)

16. SHIPPING INCIDENTS

- a. Have any shipping incidents occurred since (date) NONE
- 1) Was incident documented: Yes _____ No _____
- 2) If "Yes" documentation appears adequate: Yes _____ No _____
- b. Comments (reports to DOT, etc.): _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

17. NOTIFICATIONS AND REPORTS

- a. Licensee in compliance with 10CFR 19.13 (reports to individuals):
- Yes ✓ No _____
- b. Licensee in compliance with 10CFR 20.405 (over exposures):
- Yes ✓ No _____
- c. Licensee in compliance with 10CFR 20.403 (incidents):
- Yes ✓ No _____
- d. Licensee in compliance with 10CFR 20.402 (theft or loss):
- Yes ✓ No _____
- e. Comments: _____
- _____
- _____
- _____
- _____
- _____
- _____

18. POSTING OF NOTICES

- a. Licensee in compliance with 10CFR 19.11(a) or (b): Yes ☒ No ☐
- b. Licensee in compliance with 10CFR 19.11(c): Yes ☒ No ☐
- c. Comments: _____
- _____
- _____

19. ENVIRONMENTAL MONITORING PROGRAM

- a. Environmental Monitoring Program required: Yes ☐ No ☒
- b. If "Yes" records reviewed: Yes ☐ No ☐
- c. Period reviewed: _____
- d. Records appeared adequate: Yes ☐ No ☐
- e. If Environmental Program is not required, briefly describe any existing program: _____
- _____
- _____
- _____
- _____

20. CONFIRMATORY MEASUREMENTS

- a. Independent measurements made by inspector: Yes ☒ No ☐
- b. Comments (describe type, results, comparison with licensee results): _____
- Used NRC Eberline E-520 ; SN 2181 ; calibrated 12/2/8
- Surveyed storage area (industrial gauger) in building # 492. 18" from storage cage = 0.5 m²/hr max
- _____
- _____
- _____

21. INDEPENDENT INSPECTION EFFORT

a. Comment on type of independent inspection effort conducted: Toured
Various labs in 1803 building, incinerator
area and 492 storage building.

22. CONTINUATION FROM PREVIOUS PARAGRAPHS - USE BACK OF PAGE IF NECESSARY

Attach I

PAGE 1

LIST OF ISOTOPES AS OF 09/30/81

ISOTOPE	LOOSE (MCI)	SEALED (MCI)	TOTAL (MCI)	LIC. LIMIT (MCI)
H-3	4112.719	16009.000	20121.720	100000.000
C-14	1818.060	1.450	1819.510	3000.000
CL-36	2.707	0.000	2.707	1000.000
FE-55	0.010	754.100	754.109	1000.000
CO-57	0.000	25.000	25.000	1000.000
CO-60	140.901	0.040	140.941	3000.000
NI-63	0.916	1010.000	1010.916	3000.000
KR-85	0.000	4260.560	4260.560	25000.000
SR-90	0.000	452.102	452.102	1000.000
TC-99	0.002	0.000	0.002	1000.000
CD-109	0.000	178.050	178.050	1000.000
I-125	0.000	0.000	0.000	1000.000
RU-106	0.000	0.000	0.000	1000.000
CS-137	176.599	224259.555	224436.155	300000.000
CE-144	0.000	0.000	0.000	1000.000
PM-147	0.013	0.000	0.013	1000.000
TL-204	0.107	0.000	0.107	1000.000
PO-210	0.000	74.000	74.000	5000.000
RA-226	0.000	95.360	95.360	0.000
AM-241	0.000	65043.005	65043.005	150000.000
ZN-65	0.000	0.000	0.000	1000.000
ACP	0.000	0.000	0.000	12500.000
MFP	404.040	0.000	404.040	25000.000
P-32	0.000	0.000	0.000	1000.000
CM-244	0.000	40.000	40.000	5000.000
PU-238	0.000	180.000	180.000	270.000
SN-119M	0.423	0.000	0.423	1000.000
BA-133	0.000	5.000	5.000	1000.000
ZR-95	36.459	0.000	36.459	1000.000

ALL ISOTOPES WITH HALF LIFE LESS THAN 50
YEARS ARE DECAYED BY THE COMPUTER

FOLLOW-UP ON BULLETIN 79-19

1. If the licensee has received Bulletin 79-19 but does not ship waste, check this line _____ and fill out response form 1.

2. If the licensee ships waste for offsite burial:

a. Does the licensee have current copies of DOT and NRC shipping regulations?

Yes ☒ No ☐

b. Does the licensee have on hand a set of current requirements placed on waste burial firms by the States of Nevada, South Carolina or Washington or the waste collector if a contractor is used?

Yes ☒ No ☐

c. Procedures

(1) Written and management approved procedures?

Yes ☒ No ☐

(2) Procedures insure that waste shipped will conform to limits at burial site with respect to chemical and physical form and quantity of radioactive material in consignee's license?

Yes ☒ No ☐

(3) Procedures include requirements of applicable NRC and DOT regulations?

Yes ☒ No ☐

d. Training

No specific training. All waste shipments are handled by RSO.

(1) Licensee has provided training for personnel involved in the transfer of radwaste?

Yes ☐ No ☒

(2) This training is documented?

Yes ☐ No ☐

*e. Does the licensee have an audit program for his radwaste shipping activities?

Yes ☒ No ☐

f. Has the licensee conducted an audit of waste shipment activities?

Yes ☒ No ☐

When? During 5/81 shipment

* Describe audit scope and findings. No formal audit

by mgmt. Waste shipped approximately once per year; at which time current shipping procedures are evaluated to determine if activities are in compliance with NRC & DOT Regulations

3. If the licensee has no waste packages on hand to inspect, check this line and send response form 2 if all findings are satisfactory ____.
4. If the licensee has a package(s) available to inspect, perform the inspection and send response form 3 if packages are satisfactory ☒.
5. If deficiencies in the above are noted use form 4 in your response to headquarters. Document below which licensee actions are needed to bring program up to requested level.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION III

Docket No. _____

License No. _____

Licensee: _____

Inspection Dates: _____

Inspector(s): _____

Scope of Inspection: In addition to a routine, complete inspection of the licensed program, this inspection also sought to verify that the licensee had taken the actions required by IE Bulletin 79-19 with respect to activities related to the transfer, packaging and shipping of low-level radioactive waste material.

Summary of Findings and Proposed Enforcement Action: This licensee does not ship radioactive waste for disposal by burial. If in the future this policy changes, IE Bulletin 79-19 will be implemented.

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION 3

Docket No. _____

License No. _____

Licenses: _____

Inspection Dates: _____

Inspector(s): _____

Scope of Inspection: In addition to a routine, complete inspection of the licensed program, this inspection also sought to verify that the licensee had taken the actions required by IE Bulletin 79-19 with respect to activities related to the transfer, packaging and shipping of low-level radioactive waste material.

Summary of Findings and Proposed Enforcement Action: The licensee replied to IE Bulletin 79-19 with a letter dated _____ detailing the radioactive waste disposal program and responding to the specific questions in the Bulletin. Observation of radioactive waste packaging, disposal, and documentation practices during this inspection confirmed the accuracy of the licensee's _____ letter. Enforcement action related to the licensee's transfer, packaging and shipping of low-level radioactive waste material does not appear to be appropriate.

Package Inspection Results:

Number of Packages Opened: Zero

Results: The licensee had no radioactive waste on hand at the time of the inspection that was packaged and ready for shipment.

21-00265-06
License File

OCT 12 1984

Dow Chemical U.S.A.
ATTN: Gordon W. Engdahl
Co-Radiation Safety Officer
1803 Building
Midland, MI 48640

License No. 21-00265-06

Gentlemen:

This refers to the special safety inspection conducted by Mr. W. J. Slawinski of this office on August 9, 1984, of activities at Dow Chemical Midland, Michigan authorized by NRC Material Licenses No. 21-00265-06, No. SNM-1451, No. 21-08362-08, No. 21-08362-09, No. 21-08362-05 or No. 21-08362-12. and to the discussion of our findings with you, Dr. Fred Blanchard, and Mr. Gerald Wasserman at the conclusion of the site inspection and to the telephone conversations with Schlumberger, Birdwell, and Michigan Department of Natural Resources representatives on August 17 and 20, 1984.

The purpose of the inspection was to investigate third party allegations concerning licensee use and disposal of radioactive materials in chemical and brine deep well systems. The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

The allegations were not substantiated. No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractors) believe to be exempt from disclosure under 10 CFR 9.5(a)(4), it is necessary that you (a) notify this office by telephone within ten (10) days from the date of this letter of your intention to file a request for withholding; and (b) submit within twenty-five (25) days from the date of this letter a written application to this office to withhold such information. If your receipt of this letter has been delayed such that less than seven (7) days are available for your review, please notify this office promptly so that a new due date may be established. Consistent with Section 2.790(b)(1), any such application must be accompanied by an affidavit executed by the owner of the information which identifies the document or part sought to be withheld, and which contains a full statement of the reasons which are the bases for the claim that the information should be withheld from public disclosure. This section further requires the statement to address with specificity the considerations listed in 10 CFR 2.790(b)(4). The information sought to be

K-5

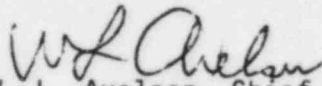
~~8412170402~~
2pp.

OCT 12 1984

withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified periods noted above, a copy of this letter and the enclosed inspection report will be placed in the Public Document Room.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,


W. L. Axelson, Chief
Nuclear Materials Safety and
Safeguards Branch

Enclosure: Inspection Report
No. 030-04783/84-01(DRSS)

cc w/encl:

J. Camburn, Michigan Department
of Public Health
3500 N. Logan
Post Office Box 30035
Lansing, MI 48909

D. Schultz, Michigan Department
of Natural Resources
State Office Building
411-J E. Genessee
Saginaw, MI 48607

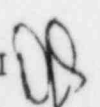
DMB/Document Control Desk (RIDS)

RIII

W.A.S.
Slawinski/sf
09/05/84

9/6/84
10/5/84

RIII


Srenjanski

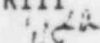
9/6/84
10/5/84

RIII


Weil

10/7/84

RIII


Axelson

10/7/84

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 030-04783/84-01(DRSS)

Docket No. 030-04783

License No. 21-00265-06

Category: E1A

Priority: 3

Licensee: Dow Chemical U.S.A.

Inspection At: Dow Chemical U.S.A.
Midland, MI 48640

Site Inspection Conducted: August 9, 1984

Telephone Contacts: August 17 and 20, 1984

Inspector: W. J. Slawinski
Radiation Specialist

W.J. Slawinski

10/5/84
Date

Reviewed By: D. J. Sreniawski, Chief
Nuclear Materials Safety
Section 2

D.J. Sreniawski

10/5/84
Date

Approved By: *W.L. Axelson*
W. L. Axelson, Chief
Nuclear Materials Safety
and Safeguards Branch

10/10/84
Date

Inspection Summary

Site Inspection on August 9, 1984 (Report No. 030-04783/84-01(DRSS))

Areas Inspected: Special, announced safety inspection to investigate third party allegations regarding Dow Chemical's disposal of radioactive materials into its deep well systems and unauthorized use of radioactive tracer materials in these wells. The inspection involved five inspector-hours onsite by one NRC inspector.

Results: The allegations were not substantiated. No violations of license conditions or regulatory requirements were identified.

~~8412170408~~

8pp.

DETAILS

1. Persons Contacted

- *Gordon Engdahl, CIH, Industrial Hygienist and Co-Radiation Safety Officer, Dow Chemical
- *Fred Blanchard, Ph.D., Associate Scientist and Radiation Safety Committee Member, Dow Chemical
- *Gerald Wasserman, Manager, Industrial Hygiene Services, Dow Chemical
- Ronald Gallow, Well Superintendent, Dow Chemical
- Daniel Schultz, Water Quality Specialist, Michigan Department of Natural Resources
- Harold Fitch, Ground Water Geologist, Michigan Department of Natural Resources
- **Al Rarick, Acting Chief, Mineral Wells Unit, Michigan Department of Natural Resources
- **Joseph Karabots, Field Engineer, Schlumberger Technology Corporation
- **James Hall, Field Engineer, Schlumberger Technology Corporation
- **Richard Cook, Vice President of Operations, Dart Oil and Gas Company. (Former Production Supervisor of Wells Department, Dow Chemical)
- **James Camburn, Chief, Division of Radiological Health, Michigan Department of Public Health

*Denotes those Dow Chemical employees interviewed on August 9, 1984.

**Denotes those contacted by telephone only.

2. Purpose of Inspection

This was a special inspection to investigate Dow Chemical's alleged disposal of radioactive materials through their deep well systems and unauthorized use of radioactive tracer materials in these wells. Allegations were submitted to the NRC Region III office. Additional information was relayed to the NRC inspector by other associated allegeders in a telephone conversation on August 8, 1984.

3. Allegations

Allegations transmitted in letter dated June 26, 1984, were primarily two-fold: 1) Dow Chemical in Midland, Michigan may have disposed of radioactive materials through its deep well method of disposal and 2) may have used radioactive materials in their deep wells as tracers.

These allegations reference an April 1979 report prepared by the Michigan Department of Natural Resources, Water Quality Division, entitled "Investigation of Groundwater Quality in the Hemlock Area of Saginaw County." This report states on page 13, referring to Dow Chemical activities in October 1978. "They demonstrated the well to be intact by conducting casing inspection and cement bond logs and a radioactive tracer survey."

Additional related information was provided to the NRC inspector in telephone conversations on August 8, 1984. Such information concerned the observance of unidentified trucks in 1979 or early 1980, with radioactive material placards, near Dow Chemical's deep wells in the Porter Township Area of Midland County. These individuals also relayed to the inspector hearsay allegations wherein radioactive tracers were inserted into Dow's deep well system and aerial radiation surveys were performed to determine if the well's pipelines were intact and to follow the tracers migration thru the substrata. These latter activities were alleged to have been performed in the 1978-1980 period.

No other specific information concerning these alleged activities was provided. Allegers doubted whether these activities are current practices.

4. Dow Chemical's Deep Well System

For over a century, widespread well drilling activities have been conducted in the Saginaw County of Michigan to explore and develop the natural resources in this area. Since as early as 1859, brine was being mined from the Marshall Sandstone formation in Saginaw. This formation, some 2000 feet below the surface, required drilling deep wells to find and use this resource. Over the years, several companies have been involved in this enterprise with varying degrees of success.

Dow Chemical owns and operates two distinct deep well systems located in the Midland Michigan area. These systems are the brine wells or solution mining wells and their chemical wells. The latter are used for chemical waste disposal and are located completely within the confines of the Dow plant. These wells were said to have been last used in 1982 and sealed in early 1983. Brine wells consist of production and reinjection wells, totaling about 100 wells, and encompass some 150 miles of transmission pipeline in the Midland area and throughout outlying areas.

The Dow brine wells, under pressure of about 171 psi, pump natural brine deposits from the substrata back to the Dow plant for processing (production wells). These wells, in use since the 1950's, are typically 3000 to 5500 feet below ground level. Processing involves extraction of calcium chloride, bromines, magnesium and other materials from the brine. Spent brine is then returned to the substrata from which it originated via the brine reinjection or disposal wells. Since the early 1970's, these operations have been regulated by the Geological Survey Division of the Department of Natural Resources under the Mineral Well Act.

Spent brine is sent to Dow's onsite brine pit,, termed lagoon pit No. 6, which discharges at 5000 gallons per minute thru a single outlet and into transmission lines. Transmission lines are parallel pipelines, one carrying brine from production wells to the Dow plant in Midland and the other returning spent brine from the plant to the reinjection wells. The lines are buried about 3-6 feet below ground surface.

In the mid 1970's, brine production operations began making greater use of a deeper strata, the Sylvania formation, some 7000 feet below ground surface. ReInjection of spent brines into the 5500 foot depth Dundee formation is being phased out.

Most of the brine wells have a small pond constructed next to them. These ponds serve as fresh water sources that can be added to saturated brines withdrawn by production wells so that the salts do not precipitate out as the brines cool. Ponds are also used to catch any spilled brine when accidental losses at the well head occur.

Well sites normally consist of a large pump, associated gauges, and about six inch diameter transmission pipelines emanating from the ground. Access to these pumping stations are usually restricted by a locked fence.

5. Interview of Licensee Personnel

On August 9, 1984, the inspector interviewed Dow Chemical employees identified in Section 1 of this report. Mr. Engdahl has been employed at Dow Chemical in Midland for nearly eleven years and involved in radioactive material usage from 1973-1976, 1979 and 1983 to present. Dr. Blanchard has been employed by Dow since 1957 and involved in radioactive material usage since this time. Mr. Wasserman began working at Dow in 1976, the last four months in his current capacity.

The inspector questioned each individual regarding the allegations. Their responses were as follows:

Allegation: Has Dow Chemical in Midland, Michigan ever disposed of licensed radioactive material thru its deep well systems? This includes both intentional or accidental releases in either the chemical or brine well systems.

Response: All individuals stated that, to the best of their knowledge, Dow Chemical has never disposed of licensable quantities of radioactive materials into their deep well systems. This includes the brine production/reinjection wells and the chemical wells. They stated Dow has three authorized methods for disposal of radioactive materials. One of these three methods is always used.

1. Incineration, authorized by NRC License No. 21-00265-06.
2. Transfer to an authorized disposal agency for eventual burial at a licensed disposal site.
3. Storage of short lived materials for decay until natural background levels are achieved.

Allegation: Have radioactive materials ever been used in wells for tracer studies? Specifically, were radioactive tracers used in wells in 1977-1980?

Response: Well logging operations have been periodically conducted in Dow's well system by outside contractors. No specific information on 1977-1979 logging operations (i.e., isotopes, quantities, etc.) was available. The individuals stated that such operations probably involved the use of sealed well logging sources and perhaps tracer materials commonly used by logging companies. The inspector was informed that Schlumberger Technology Corporation of Mt. Pleasant, Michigan performed logging services for Dow in 1978 and 1979 (Refer to Section 6).

Allegation: Radioactive tracers were inserted into Dow's well system and aerial radiation monitoring was performed to follow the migration of the tracers.

Response: Tracer studies have been performed by licensed well logging companies to check well casing integrity but no aerial radiation monitoring was ever performed for this purpose.

Dow routinely performs aerial flyovers of its wells to check for visible damage, breaks, leaks, etc. This is a visual surveillance and is not for the purpose of radiation monitoring. Such flyovers were typically performed on a weekly basis using a helicopter.

Allegation: An unidentified truck, placarded with radioactive material signs, was observed near a Dow well in the Porter Township area of Midland County in or about 1979. Allegers believe radioactive materials may have been disposed into the wells at this time.

Response: Such a vehicle was probably a well loggers truck contracted by Dow to perform well logging operations. No disposals of radioactive material were ever made into wells.

6. 1977 - 1979 Well Logging Activities

Dow Chemical does not maintain records of specific logging operations performed of its wells. They indicated that any logging operations utilizing radioactive materials that were performed in 1977-1979, were contracted to Schlumberger or perhaps Birdwell, both working out of regional offices in Mt. Pleasant, Michigan.

a. Schlumberger Technology Corporation

Schlumberger out of Houston, Texas is licensed by the NRC to possess and use specified byproduct and special nuclear materials for well logging purposes. Authorization includes use of iodine-131, in any form, for tracer studies in well logging at temporary job sites anywhere in the U.S. where the NRC maintains jurisdiction.

The inspector was informed by Schlumberger representatives that records of specific well logging operations were typically maintained for about one year. Documentation of activities prior to 1983 are

no longer maintained. However, a Schlumberger employee was identified by Dow as having performed logging work for them on October 5, 1978. This individual, still employed by Schlumberger, recalled performing a radioactive tracer study in a Dow deep well sometime in late 1978. This appears to coincide with the alleged radioactive tracer studies performed during this same time period. He recalled this particular job because of the irritating mechanical noise level present at the time, perhaps from the well's pump.

This individual indicated that he performed a radioactive tracer study at one of Dow's brine wells, number unknown, to determine if the well's casing was intact. He stated that 15-20 millicuries of liquid iodine-131 was deposited into the well and radiation surveys were performed to evaluate possible breaches in the well's encasement. He recalls no breaks or leaks being detected and the well was found to be sound. The individual stated that this type/quantity of radioactive material is routinely used in many tracer studies. He does not recall any other tracer studies or logging activities using radioactive material being performed for Dow during the 1977-1979 period.

b. Birdwell Wireline Services

Birdwell Wireline Services, a division of Seismograph Service Corp., is a well logging company out of Tulsa, Oklahoma licensed by the NRC to possess and use byproduct and special nuclear materials for well logging purposes. They too are authorized to use licensed material at temporary job sites anywhere in the U.S. where the NRC maintains jurisdiction. Like Schlumberger, they normally maintain records of completed logging activities for approximately one year.

Messrs. Cook and Rarick, identified in Section 1 of this report, indicated that Birdwell has periodically performed logging operations utilizing radioactive material for Dow Chemical. Both individuals recalled a well logging incident involving radioactive materials which occurred in one of Dow's wells in the late 1970's. This incident involved the loss and subsequent recovery of a cesium 137 sealed well logging source down one of Dow's brine wells. This incident was reported to the NRC and is documented in letters dated April 19, 1977 and July 1, 1977 (Attachment I). The source was retrieved intact and the matter was considered closed by the NRC, as documented in letter dated July 20, 1977 (Attachment II).

No violations of regulatory requirements were identified.

7. Brine Samples

Unrelated to the inspection, a 500 milliliter liquid sample was taken from each of three Dow brine reinjection wells by the Michigan Department of Natural resources on August 13, 1984. These samples were analyzed for chemical constituents by the Michigan Department of Natural Resources laboratory in Lansing, Michigan. The Commission arranged for these

samples to be analyzed for possible radioactive contents. Samples are being analyzed by the Michigan Radiological Health Department Laboratory for gross alpha, beta, and gamma activity. The results of this analysis will be sent under separate cover.

8. Conclusions

Based on interviews of Dow personnel and discussions with well logging firms and Mr. Rarick of the Michigan Department of Natural Resources, no evidence was found to indicate that Dow Chemical has disposed of licensable quantities of radioactive materials through its deep well systems. Dow Chemical maintains receipt, transfer, and disposal records for radioactive materials possessed by their Midland facility.

Radioactive tracer studies have been performed in Dow's brine wells by well logging companies licensed by the NRC or agreement states to provide such services. Such well logging companies are routinely inspected by the NRC or agreement states to review its radiation safety programs and determine if the licensee is conducting operations in accordance with license conditions and applicable state and federal regulations.

The April 1979 Department of Natural Resources report referenced in these allegations states that Dow performed a "radioactive tracer study" in October 1978 to demonstrate if well casings were sound. The NRC inspector determined that a radioactive tracer study was in fact performed in one of Dow's brine reinjection wells on October 5, 1978. This study was performed by Schlumberger Technology Corp. engineers out of Mt. Pleasant, Michigan. Specific records of this work are no longer maintained by either Dow or Schlumberger. However, the Schlumberger engineer who performed the October 1978 study for Dow recalled that 15-20 millicuries of liquid iodine-131 was used in the well. This is authorized by the NRC license.

Iodine-131 has a radioactive half-life of 8.04 days. Accordingly, all radioiodine inserted into the well, a typical amount used in such tracer studies, decayed to natural background levels within 90 days. Also, the large water flow of this well system, reported to be 5000 gallons per minute, easily diluted the radioactive concentration to below 10 CFR 20.106 limits.

The loss and subsequent recovery of the cesium-137 sealed source in 1977 is judged not to have adversely impacted the ground waters or substrata into which it fell. The source was recovered intact with no leakage of its contents detected.

We are aware of one overflight performed in Michigan for the purpose of conducting an aerial radiation monitoring survey. This was performed over the Kawkawlin, Michigan area in May 1980 of the Michigan Chemical Corporation and is documented in NRC Reports No. 40-17/83-01(DRMSP), No. 40-1790/83-01(DRMSP), and EG&G letter report, NRC-8103, dated April 19, 1981. The purpose of this overflight was to determine typical background radiation levels within the local area and to locate any areas which might contain above background levels.

No violations of regulatory requirements were identified.

9. Exit Interview

The inspector met with those Dow Chemical employees denoted in Section 1 at the conclusion of the site inspection on August 9, 1984. The discussion consisted of a review of the allegations and their responses. The inspector stated that other individuals would be contacted and the allegations reviewed in greater detail before a final determination was made. They were informed that a report, documenting the NRC's findings, would be sent to Dow Chemical and the alleged(s).

Attachments: As stated



DOW CHEMICAL U.S.A.

MIDLAND, MICHIGAN 48640

April 19, 1977

US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Gentlemen:

While logging Dow's Brine Well #33, 8552 feet deep, located in Midland, Michigan, a source containing 200 millicuries of Cs-137 was dropped by the Birdwell Company, Tulsa, Oklahoma, operating out of Mt. Pleasant, Michigan. The radioactive source, doubly encapsulated in stainless steel, was attached to a device designed to measure density of the well liquids. The #33 well operations have stopped until the source is recovered. All liquids and equipment removed from the well will be surveyed for radioactive contamination. Information concerning source recovery may be obtained from B. R. Thomas, 517/636-2999.

This report may be a duplicate of a Birdwell report.

Sincerely,

R. R. Langner, Chairman
Radiation Safety Committee
1803 Building
517/636-4344

bjd

cc: Michigan Department of Public Health, Lansing, Michigan

~~8506050388~~

ATTACHMENT I

Ip.

Seismograph Service Corporation
A SUBSIDIARY OF BAYVIEW COMPANY

Birdwell Division
P.O. BOX 1550 • TULSA, OKLAHOMA 74101 • (918) 437-2222

1 July 1977

55-05651-

Mr. Tom Lonergan
Nuclear Regulatory Commission
Region 3
799 Roosevelt
Glen Ellyn, Illinois 60137

Mr. Lonergan:

The 200-mc Cesium source that was reported to you on April 13, 1977 by Bill Fry as being loose in the Dow Chemical well near Midland, Michigan has been recovered and is in Birdwell's possession.

The source is in excellent condition and has not been damaged or altered.

Sincerely,

J. D. Hall
J. D. Hall
Operations Manager

JDH/st

~~8506050396~~
1p

JUL 20 1977

Telegraph Service Corporation
Hirovill Division
ATTN: J. D. Hall, Operations
Manager
P.O. Box 1553
Tulsa, OK 74102

License no. 35-05651-01

Gentlemen:

This is to acknowledge your letter of July 1, 1977, regarding the recovery of a 200 psi casing 137 inches which was reported loose from a well in Midland, Michigan on April 12, 1977.

Thank you for your cooperation.

Sincerely,

James H. Allan, Chief
Fuel Facility and
Materials Safety Branch

cc: Glen Brown, Chief,
WASH Branch, DIV

cc u/ltr dtd 7/1/77:
Central Files
✓ Reproduction Unit ARC 202
FBI
HSC

ATTACHMENT II

8506050400 1p

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 81-01

Texas State License No. 11-2176

Licensee: Graver Southwest
Div. of Aerojet-General Corporation
P.O. Box 1764
Houston, Texas 77001

Facility Name: The Dow Chemical Company
Midland, Michigan 48640

Inspection Conducted: June 25, 1981

Inspector: J. R. Mullauer *DJS for*
Radiation Specialist

Approved By: D. J. Sreniawski, Chief *D.J. Sreniawski 8/6/81*
Materials Radiation Protection
Section 2

Inspection Summary

Inspection on June 25, 1981 (Report No. 81-01)

Areas Inspected: Routine, unannounced inspection of licensee audits; training, radiation protection procedures; equipment and facilities; receipt and transfer; personnel radiation protection, external and internal; shipping incidents; notifications and reports; inspection and maintenance of equipment; inventory of byproduct material. The inspection involved six inspector-hours onsite by one NRC inspector.

Results: Of the eleven areas inspected, no items of noncompliance were identified.

~~81111006424pp.~~

DETAILS

Persons Contacted

Graver Tank:

- *Gary Bucek, Operations Superintendent
- *Bob Busch, Operations Assistant
- *Frank Breeden, Radiographer Level 2
- *Mary Busch, Assistant Radiographer Level 1

Dow Chemical Company:

- *Tracy Parsons, Health Physicist
- Charles Vaughn, Industrial Hygienist

*Denotes those present during the exit interview.

1. Licensee Audit

The inspector questioned the licensee about their internal audit procedures. A licensee representative stated that Sam Wright (Radiation Safety Officer) conducts internal audits during frequent visits from Houston. No record of such audits are maintained at the temporary job site.

2. Training

The inspector examined records of training provided by the licensee. Copies of tests and the results were available for Mary Busch and Frank Breeden. Both had certificates from NDT; Level 1 radiographer for Mary Busch and Level 2 radiographer for Frank Breeden. Copies of training records for Gary Bucek were not available for review; however, a licensee representative stated that Gary is not involved in radiographic work. Bob Busch completed a course in Radiation Safety presented by Radiation Consultants, Houston, Texas; records of this training were not available for review.

3. Radiation Protection Procedures

The inspector observed the radiography of a weld joint of a storage tank. The boundaries of the restricted areas were properly posted. The inspector surveyed the boundaries with the source in the exposed position and found radiation levels to be less than 2 mR/hr. The radiographer and assistant radiographer were properly monitored with film badges and 0-200 mr dosimeters. The inspector observed survey procedures during the operations. Two survey meters were noted at the site of operations. The radiographer and assistant radiographer used these to continuously monitor areas of interest.

4. Equipment and Facilities

The radiographic operations are performed inside of four new storage tanks being built at Dow Chemical Company. A 100 curie (January 28, 1981) Ir-192 Model A1A, Serial Number 127011 and a 100 curie (May 22, 1981) Ir-192 Model RG-13, Serial Number 4921 sources were used. The Model A1A source was used on the day of inspection. The exposure time was approximately 2.5 minutes. The camera used by Gamma Industries had Serial Number 27011. The radiation areas were demarcated by rope and properly posted. The 0-200 mr dosimeters were checked for exposure three times a day. Both survey meters were last calibrated on April 6, 1981.

5. Receipt and Transfer

No records of receipt and transfer are maintained at the temporary job site. These records are maintained at the main office in Houston.

6. Personnel Radiation Protection - External

The licensee used the film badge service provided by the State of Texas. Film badges are mailed each month to Austin, Texas. Exposure records are not maintained at the temporary job site. Monitored personnel record their daily dosimeter readings. No intercomparisons are made between film badge readings and dosimeter readings. The licensee maintains a daily utilization log which contained all the required information.

7. Personnel Radiation Protection - Internal

The Ir-192 Model A1A source was last tested for leakage on January 28, 1981, and the Ir-192 Model RG-13 source was tested for leakage on May 22, 1981. Records indicate the amount of removable contamination was less than 0.005 microcuries.

8. Shipping Incidents

There have been no shipping incidents according to statements of a licensee representative.

9. Notifications and Reports

Exposure reports are maintained by the State of Texas, Austin, Texas.

10. Inspection and Maintenance of Equipment

The radiographer performs a maintenance check of the equipment on a daily basis and records the results on the daily utilization form.

11. Inventory of Byproduct Material

The licensee is using the authorized sources and exposure devices for radiography purposes.

The licensee performs a daily inventory of both sources.

Exit Interview

The results of the inspection were reviewed at the conclusion of the inspection with the individuals noted in the "Person Contacted" section of the report. The licensee was informed that correspondence concerning this inspection would be forwarded to the Texas Department of Health.

midland



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PRINCIPAL STAFF			
✓ RA		DPRP	
D/RA		DE	
A/RA		DRM	
✓ RC		DRM	
✓ PAO		SCS	
SGA		ML	
ENF		File	

May 11, 1984

✓ 00313

MEMORANDUM FOR: Stephen H. Lewis
Regional Counsel, RIII

FROM: Dan M. Berkovitz
Office of the General Counsel

SUBJECT: DOW CHEMICAL V. CONSUMERS POWER LAWSUIT

DB

Attached please find the letter from Eugene Driker that I received today. We discussed this topic last Monday.

I agree that NRC must treat allegations received from Dow no differently from allegations received from others, but I nonetheless am concerned about the manner in which this is done. I now question whether we should do anything on an "informal" basis - even provide documents. The parties are eager to seize upon whatever we do as a statement on the merits of the case. Dow's attorneys appear especially aggressive in this respect (as well as in others). I don't want to be constantly explaining our "informal" actions that one side claims favors the other nor do I want NRC's position to be misrepresented.

An alternative approach, however, is to ignore the name-calling and just continue to do what we believe to be correct. A possible response to Mr. Driker is simply to tell him that the "exchange of information" between NRC and Dow referred to the manner in which NRC chose to respond to Dow's FOIA request and that Consumers has the same opportunity to examine our files. (Assuming that is the case.)

Let's discuss whether we need to become even more formal with the parties or whether we should just continue as is.

K-9

~~8448154686~~ 1p

IMAY 14 1984

Barris, Sott, Denn & Driker

*Donald E. Barris
Herbert Sott
David L. Denn
Eugene Driker
William G. Barris
Sharon M. Woods
Stephen E. Gloger
Robert E. Kass
David H. McConnell
Charles J. Rudy*

*Daniel M. Shaw
Elaine Feldman
Andrew M. Jack
Marley Weiss
David L. Rogers
Gayle B. Janssens
John P. Timmons
John A. Lilly
James S. Featicharo*

*21st Floor First Federal Building
1001 Woodward Avenue
Detroit, Michigan 48226-1972*

May 4, 1984

Daniel Berkovitz, Esq.
Office of General Counsel
Nuclear Regulatory Commission
Washington, D.C. 20555

Re: The Dow Chemical Company v
Consumers Power Company

Dear Mr. Berkovitz:

Confirming our telephone conversation of Friday, enclosed are copies of various newspaper stories indicating that representatives of The Dow Chemical Company met with NRC personnel to discuss matters at issue in the litigation now pending in the Midland County Circuit Court with Consumers Power Company.

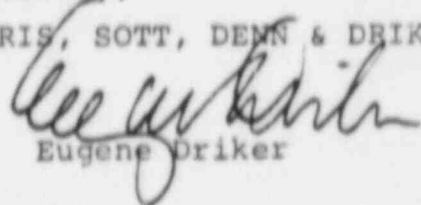
Also enclosed is a statement given to us by William Jentes of Kirkland & Ellis, counsel for Dow. Mr. Jentes indicated that this statement was read to the press in response to inquiries. We particularly call your attention to the last sentence, indicating that Dow "had cooperated with the NRC for an exchange of information as a result of the current discovery process in the Dow/CP suit."

We understand the position of your office to be that NRC staff personnel will not meet informally with representatives of either Dow or Consumers Power Company. If that is the position of the NRC, then we are concerned about the apparent ability of Dow attorneys to discuss the issues and the evidence in our case with members of the NRC staff.

We look forward to hearing from you after you've had an opportunity to review these materials.

Sincerely,

BARRIS, SOTT, DENN & DRIKER

By: 
Eugene Driker

ED:mw
Enclosures

MAY 14 1984

13pp-8408150692

4/30/84
Rec'd in Court
from W. Jentes
G. Diker

The documents in question refer to correspondence with Dow and the NRC and relate to information Dow determined was germane to its original contentions^{info} that Consumers withheld material from Dow prior to the conclusion of the 1978 contract negotiations between Dow and Consumers. As you know, it's the withholding of this initial information that led Dow to seek relief from the courts of its 1978 contract.

These and other documents will be reviewed in normal discovery process as this issue proceeds through normal judicial ~~procedure~~^{steps}.

We really can't elaborate any further, the matter is currently in litigation.

Above statement given to Detroit Free Press and Booth Newspaper (lansing bureau) on p.m. of 4-26

Press calls from WNEM-TV 5, Saginaw, WDIV-4, Detroit, Booth Newspapers, Saginaw News, Midland Daily News & Detroit News received 4-27 as result of F.P. article...all told basically same as above...stressed that Dow initiated nothing, only that we had cooperated with the NRC for an exchange of information as a result of the current discovery process in the Dow/CP suit.

BORING LOG				PROJECT		HOLE NO.		HOLE DEPTH		HOLE DIA.	
MIDLAND POWER PLANT				229-101		1		1		8	
Evaporator & Auxiliary Bldg.				At Footing 4-Ca				90°		90°	
DATE		COMPLETED		DRILLER		DRILL NAME AND MODEL		HOLE DIA.		TOTAL DEPTH	
9/29/77		9/29/77		Singleton (Abel Drilling)		CMH-330		8"		36.5'	
BORE DEPTH (FT)		BORE DIA.		BATHYMETRY		BL. PER FT. BATHY		SP. GRAV. BL.		CORRECTION BATHY	
14		14		14		14		14		14	
140 lb/10 inches		Name		J. R. Givens							
PENETRATION BLOWS		ELEVATION		DEPTH		CORRECTION		DESCRIPTION AND CLASSIFICATION		REMARKS	
10' 0"		629.0		0				0-3.5' Silty Sand, tan (Fill)		5' auger to 8.5' Drilling with 4" tri-cone and recirculating water	
10' 0"		628.5		3.5'				3.5-4.5' Concrete mudcap		Qp1=4.5+ TSF	
10' 0"		628.5		4.5'				4.5-9.5' Clayey Sand to sandy Clay, gray, very stiff, slight to low plasticity, slight moisture (SC/CL) (Fill)		Qp2=4.5+ TSF	
10' 0"		623.9		9.5'				9.5-12.0' Clayey Silty, brown, peb pebbles to 1/2", rust stain, low moisture, low plasticity (MC/Fill)		Qp1=4.5+ TSF	
10' 0"		621.0		12.0'				12.0-15.5' Silty Clay, brown with trace gray, low plasticity, low moisture, pebbles to 1/8", hard (CL)		Qp1=4.5+ TSF	
10' 0"		617.9		15.5'				15.5-18.0' Sand, gray, medium (Fill)		Qp1 (none-sand)	
10' 0"		615.0		18.0'				18.0-19.0' Sand, gray, medium (Fill)		Qp1=4.5+ TSF	
10' 0"		614.0		19.0'				19.0-20.0' Sand, gray, medium (Fill)		Qp1=4.5+ TSF	
10' 0"		612.5		20.0'				20.0-21.0' Gray Sand, dense (SP) (Fill)		Qp1=4.5+ TSF	
10' 0"		608.3		21.0'				21.0-22.5' Silty Sand, brown with reddish tint, very stiff (CL)		Qp1=4.5+ TSF	
10' 0"		607.0		22.5'				22.5-24.0' Brown (reddish tint) sand (Fill)		Qp1=4.5+ TSF	
10' 0"		605.0		24.0'				24.0-26.0' Silty Clay to clayey Sand, with seams of sand, stones to 1/2 inch (Fill)		Qp1=4.5+ TSF	
10' 0"		600.0		26.0'				26.0-28.0' Silty Sand, dark gray, dense, trace to little organics (SM) (Fill)		Qp1=4.5+ TSF	
10' 0"		596.5		28.0'				28.0-31.5' Silty Clay, brown, hard (CL) (Fill)		Qp1=4.5+ TSF	
10' 0"		596.5		31.5'				31.5-33.0' Silty Clay, brown, hard, (CL) tan sand, seams to 1/2"		Qp1=4.5+ TSF	
10' 0"		596.5		33.0'				33.0-36.5' Fine to medium sand, brown, very dense, trace clay, low moisture (SP)		Qp1=4.5+ TSF	
10' 0"		596.5		36.5'				Total Depth 36.5'		Qp1=4.5+ TSF	
10' 0"		596.5		36.5'				Elevation Bottom 596.5		Qp1=4.5+ TSF	



BORING LOG				PROJECT		JOB NO.		SHEET NO.		HOLE NO.	
DIESEL GENERATOR BUILDING				E305		7220-101		1 OF 1		D	
DATE				COMPLETED		ANALYST		SHEET NO.		HOLE NO.	
9/29/77				9/30/77		SINGLETON		90°		W.A.	
SINGLETON				(Abel)		CME-330		5"		W.A.	
CORE RECOVERY (%)				CORE LOSS		CORE TOP BY CHAIN		CORED IN		DEPTH OF CORED WATER	
N.A.				N.A.		12		N.A.		629.4	
SAMPLE & ANALYST				SAMPLING METHOD		SAMPLING DEPTH		SAMPLING TIME		SAMPLING LOCATION	
140 (lb/30 in.)				None		Jerry B. Givens					
PENETRATION BLOWS				DEPTH		REMARKS		NOTES ON		REMARKS	
1' 2' 3' 4' 5' 6' 7' 8' 9' 10' 11' 12' 13' 14' 15' 16' 17' 18' 19' 20' 21' 22' 23' 24' 25' 26' 27' 28' 29' 30' 31' 32' 33' 34' 35' 36' 37' 38' 39' 40' 41' 42' 43' 44' 45' 46' 47' 48' 49' 50' 51' 52' 53' 54' 55' 56' 57' 58' 59' 60' 61' 62' 63' 64' 65' 66' 67' 68' 69' 70' 71' 72' 73' 74' 75' 76' 77' 78' 79' 80' 81' 82' 83' 84' 85' 86' 87' 88' 89' 90' 91' 92' 93' 94' 95' 96' 97' 98' 99' 100'				629.4		0		0-4.5' Silty to sandy Clay, gray, slight to low plasticity. (CL)(Fill)		5" auger to 20.5' set casing. Begin drilling with 4" tricone roller bit and recirculating water.	
624.9				4.5		4.5-7.4' Sand, tan, medium dense, slightly moist (Fill) (SP)					
622.0				7.4		7.4-8' Concrete mudstone					
621.4				8		8-25.5' Silty to sandy Clay, gray, little gravel, low moist, low plasticity, very stiff to hard (CL)(Fill)		Op 1 = 4 TSP Op 2 = (sand) Op 3 = sample breaks up at 3.5 TSP Op 4 = 4.5+ TSP Op 5 = sample crumbles, low moisture Op 6 = 4.5 TSP Op 7 = 4.5 TSP Op 8 = 4.5+ TSP Op 9 (clot) = 4.5+ TSP Op 10 (sand) Op 11 (sand)			
603.9				25.5		23-24.2' Sear of clayey Sand, with trace organics, grayish brown					
607.9				24.2		24.2' Tan, medium sand sear, low moist					
607.9				25.5-31.5		25.5-31.5' Silty sand, brown, medium grained, wet, very dense (SM)		Hole caving in at 21' so used 3/4 lag quick pen.			
Bottom of boring at 31.5'								Water level at 10.4' after drilling.			
								Hole backfilled with soil after completion.			

Revision 13
6/82

F01961

BORING LOG

MILAN'S NUCLEAR PLANT 7220 1-1 0

DIESEL GENERATOR 306

S. 515

E. 3:5

50°

25.77 5.30/77 SINGLETON (AER. SOIL) CNE-550

5"

31.5

12

629.4 (SEE NOTES COL.)

140 1/15"

NONE

JERRY B. GIVENS

DEPTH FEET	CORRECTION FEET	TOTAL DEPTH FEET	PENETRATION BLOWS			ELEVATION	CORRECTION FEET	TOTAL DEPTH FEET	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVEL DATE WATER TEMPERATURE OR DRILLING, ETC.									
			1ST	2ND	3RD														
						629.4													
1			21	17	10	624.9			2-2.5' SILTY TO SANDY CLAY, GREY, SLIGHT TO LOW PLASTICITY (CL)	5' AUGER - 7 20.5' SFT CASING, 504 DRAILLING W. 4" TRI-LOCK RODLESS 20 AND RECIPI- WATER									
2			34	10	10	622			2-7.2' SAND, TAN, MEDIUM FINE, SLIGHTLY MOIST, (SP)	Qp#1 = 4.5T Qp#2 = (SAND) Qp#3 = SAND Qp#4 = 4.5T Qp#5 = SAND Qp#6 = 4.5T Qp#7 = 4.5T Qp#8 = 4.5T Qp#9 = 4.5T Qp#10 = 4.5T Qp#11 = (SAND) Qp#12 = (SAND) Qp#13 = (SAND) Qp#14 = (SAND) Qp#15 = (SAND) Qp#16 = (SAND) Qp#17 = (SAND) Qp#18 = (SAND) Qp#19 = (SAND) Qp#20 = (SAND) Qp#21 = (SAND) Qp#22 = (SAND) Qp#23 = (SAND) Qp#24 = (SAND) Qp#25 = (SAND) Qp#26 = (SAND) Qp#27 = (SAND) Qp#28 = (SAND) Qp#29 = (SAND) Qp#30 = (SAND) Qp#31 = (SAND) Qp#32 = (SAND) Qp#33 = (SAND) Qp#34 = (SAND) Qp#35 = (SAND) Qp#36 = (SAND) Qp#37 = (SAND) Qp#38 = (SAND) Qp#39 = (SAND) Qp#40 = (SAND) Qp#41 = (SAND) Qp#42 = (SAND) Qp#43 = (SAND) Qp#44 = (SAND) Qp#45 = (SAND) Qp#46 = (SAND) Qp#47 = (SAND) Qp#48 = (SAND) Qp#49 = (SAND) Qp#50 = (SAND) Qp#51 = (SAND) Qp#52 = (SAND) Qp#53 = (SAND) Qp#54 = (SAND) Qp#55 = (SAND) Qp#56 = (SAND) Qp#57 = (SAND) Qp#58 = (SAND) Qp#59 = (SAND) Qp#60 = (SAND) Qp#61 = (SAND) Qp#62 = (SAND) Qp#63 = (SAND) Qp#64 = (SAND) Qp#65 = (SAND) Qp#66 = (SAND) Qp#67 = (SAND) Qp#68 = (SAND) Qp#69 = (SAND) Qp#70 = (SAND) Qp#71 = (SAND) Qp#72 = (SAND) Qp#73 = (SAND) Qp#74 = (SAND) Qp#75 = (SAND) Qp#76 = (SAND) Qp#77 = (SAND) Qp#78 = (SAND) Qp#79 = (SAND) Qp#80 = (SAND) Qp#81 = (SAND) Qp#82 = (SAND) Qp#83 = (SAND) Qp#84 = (SAND) Qp#85 = (SAND) Qp#86 = (SAND) Qp#87 = (SAND) Qp#88 = (SAND) Qp#89 = (SAND) Qp#90 = (SAND) Qp#91 = (SAND) Qp#92 = (SAND) Qp#93 = (SAND) Qp#94 = (SAND) Qp#95 = (SAND) Qp#96 = (SAND) Qp#97 = (SAND) Qp#98 = (SAND) Qp#99 = (SAND) Qp#100 = (SAND)									
3			16	5	5	621.4			2-25.5' SILTY TO SANDY CLAY, GREY, LITTLE GRAVEL, LOW MOIST, LOW PLASTICITY, VERY STIFF TO HARD (CL)										
4			51	16	17	614													
5			26	10	16	608													
6			47	10	22	602													
7			65	15	29	596													
8			57	16	25	590													
9			55	20	33	584			23'-24.2' SEPM OF CLAYEY SAND W/ TALS ORGANICS, GREY, SP. SAND, CAZ TAN MEDIUM SAND 7.2' IN LENGTH										
10			107	30	42	603.9			25.5'-31.5' SILTY SAND, BROWN, MEDIUM GRAINED, WGT, VCT-100 USE (SM)	Qp#16 = 4.5T Qp#17 = 4.5T Qp#18 = 4.5T Qp#19 = 4.5T Qp#20 = (TIP) 4.5T Qp#21 = (SAND) Qp#22 = (SAND)									
11			113	35	48	604				HOLE CAVING Q 23' 30 U 3/4 BAG OF SCL									
12			102	45	55	597.9			TOTAL DEPTH = 31.5' BL. BOTTOM = 597.9	WATER LEVEL AT 10.4' AFTER DRAILLING HOLE BUILT WITH 30' SCL AFTER COM- PLETION									

N 0006124

N 0006124

2572000

DIESEL GENERATOR 306

D

E

TO: Strickling

Friday, April 27, 1984

DFP

U.S. Probes New Charges About N-Plant Agency gets Dow documents

By DAVID EVERETT
Free Press Staff Writer

The U.S. Nuclear Regulatory Commission is investigating new charges related to soil settlement problems at Consumers Power Co.'s Midland nuclear power project, the Free Press has learned.

The investigation centers on charges that Consumers or its contractors may have acted improperly in 1977 testing soils compaction work at the Midland site.

"We're talking about the possible changing of test conditions" in the soils testing, Jan Strasma, the commission's Midwest spokesman, said Thursday. He said that the agency got documents related to the allegations last week from Dow Chemical Co. and that they were given this week to the commis-

sion's Office of Investigations in Washington.

If the test conditions were changed, it could indicate that Consumers knew about the serious soils problem at the Midland plant before it told the commission about it in 1978. Consumers has insisted that it did not learn of the extent of the soils problem until mid-1978.

CONSUMERS SPOKESMAN Michael Koschik said Thursday that he could not respond to the commission's investigation without details of the allegations, but he "absolutely" denied that the utility knew the extent of soils problems before it was reported to the commission in 1978.

See MIDLAND, Page 11A

C.S. probes new charges at Midland power plant

MIDLAND, from Page 1A

Allegations referred to the commission's Office of Investigations usually involve the possibility of "deliberate or willful wrongdoing" by a utility or contractor, Strasma said.

Strasma said the allegations began with information provided by Dow, based in Midland. "Dow informally provided information to us and supplied some documents" relating to the soils testing, he said.

Dow is suing Consumers to avoid paying a penalty for canceling its contract to buy steam from the Midland plant. Consumers is counter-suing, saying Dow owes more than \$400 million.

Dow spokesman Phil Schneider said Thursday the documents were those his company consider "germane to its original contentions that Consumers withheld material information from Dow" before the steam contract was signed in 1978.

It was this "withholding of critical information" that led Dow to sue last year, Schneider said.

THE IMPROPER compaction of soils has been the most serious of several major construction mistakes at the multibillion-dollar project, now about 85 percent complete. The resulting soil settlement has caused at least one vital safety building at the nuclear project to sink more in a few months than would normally be expected in 40 years.

Consumers and its primary contractor, Bechtel Power Corp., are tunneling under many safety buildings at the plant and resupporting them with concrete.

The allegations the Nuclear Regulatory Commission is investigating "involved the original soils work, the compacting — not the work that's going on now to fix it," Strasma said.

He would not say whether the allegation was about Consumers, Bechtel or another contractor.

Wall Street analysts say the stock market is anticipating that the annual dividend on Consumers Power Co.'s common stock will be eliminated. Page 4E.

Dow gives NRC evidence against Consumers

MDN 4-27-84

By JULIE MORRISON
and The Associated Press

DETROIT—The U.S. Nuclear Regulatory Commission is investigating charges that Consumers Power Co. or its contractors altered the conditions of soil tests at the utility's Midland nuclear plant, an NRC official says.

The NRC is investigating allegations furnished by Dow Chemical Co. that soil compaction test conditions were changed in 1977, Jan Strasma, the agency's Midwest spokesman, said Thursday.

"We're talking about the possible changing of test conditions" in the soils testing, Strasma said.

A citizen intervenor in the Midland case chastised the NRC for its announcement, saying the agency had information about this issue as long as five years ago and should have launched an investigation then.

Strasma said the NRC decided to start its investigation after "Dow informally provided information to us and supplied some documents" about the testing, adding that the information

was forwarded this week to the NRC's Office of Investigations in Washington.

That office usually investigates the possibility of "deliberate or willful wrongdoing" by a utility or contractor, Strasma said.

Dow spokesman Phillip Schneider said the information was turned over to the NRC at that agency's request. He said NRC attorneys wanted it because staff members will give depositions during the upcoming lawsuit between Dow and Consumers.

"We are merely cooperating in the process of discovery with other parties in the lawsuit," Schneider said.

Dow is suing Consumers for \$60 million and attempting to avoid paying a penalty for canceling the contract to buy steam from the Midland plant. A countersuit by Consumers seeks more than \$400 million from Dow.

Dow contends in the lawsuit, filed last summer, that Consumers falsely represented to the chemical company the extent of soils problems and estimated completion dates for the plant.

Both Schneider and Strasma said

they do not know the specifics of documents released to the NRC. A Midland County Circuit Court order restricts access to documents involved in the lawsuit only to parties immediately involved.

A Consumers spokesman this morning said the utility is not aware of which documents the NRC has, adding the company has not been notified of an investigation.

However, Tom Holliday also said in a prepared statement that Consumers did not know the extent of soil settlement problems at the Midland plant before they were reported to the NRC in 1978.

Improperly compacted soils are among several construction problems at the \$3.95 billion twin-reactor plant, now about 85 percent complete.

Consumers, its primary contractor, Bechtel Power Corp., and other construction firms are tunneling beneath several buildings at the site and will pour new concrete to support buildings at the plant.

Intervenor Barbara Stamiris, of

Freeland, said questions about the soils problems and when Consumers were aware of them were brought to the NRC's attention as early as 1978.

Mrs. Stamiris said NRC inspectors learned of soils problems when they were told by a worker that a support beam in the administration building failed in 1977 because of poorly compacted soil. Consumers did not report the failure to the NRC because the building is not safety-related and was therefore not considered by the utility to be an NRC concern, she said.

"When they did find out by happenstance, the NRC should have investigated it right then," she said. "But they wait until someone puts it in their lap or until the whole thing blows up on them. I have real problems with the timing of this."

Mrs. Stamiris said the extent of soils problems also was brought to the attention of the NRC by Consumers in a 1977 audit of the soils situation. She said the company concluded that a contractor, U.S. Testing, made errors in calculation and method of testing the soils and that

the company suggested retesting some soils sites that failed previous tests.

Mrs. Stamiris said the NRC criticized the procedure because the utility did not also retest areas that passed in previous tests.

Consumers was aware of the soils problems before it began constructing the diesel generator building, which is a safety-related structure, she said.

Consumers also acknowledged the soils problems in March 15, 1981, findings, she said, when the company wrote "hindsight confirms that evidence existed in 1977, which if given different weight, would have revealed the plant-wide soils condition in time to have prevented the problems which now confront us."

The Consumers audit and written findings are the "closest we've ever come to a smoking gun that indicated in black and white there were changes in soils tests," Mrs. Stamiris said.

Strasma said specifics of the investigation have not yet been made by the NRC, adding he does not know how long the investigation will continue.

Look memories
1960s music stars 'Happy Together' at Civic Center
 Page A-8



Tigers 16-1!
They can tie league record by beating Indians tonight
 Page C-1



TODAY'S INDEX		
Area	B 73	Michigan A 45
Business	C 8	Nation A 6
Classified	B 6 11	Obituaries C 9
Comics	C 7	Sports C 1 6
Editorial	A 7	TV Update C 10
Ent.	B 35	Weather C 10
Living	A 8 9	Where, When C 10
Metro	B 13	World A 10, 11

The Saginaw NEWS

©Copyright, 1984 The Saginaw News. All rights reserved.

Friday, April 27, 1984

Showers tonight, Saturday

25¢

NRC probing Midland plant soil-test-record charges

By DAVID SEDGWICK
 News Lansing Bureau

CHICAGO — The Nuclear Regulatory Commission is probing charges that construction-related records of the Midland Nuclear Plant were falsified by Consumers Power Co. or one of its subcontractors.

The review centers on allegations that soil tests at the plant's construction site were intentionally falsified, a top NRC official said Thursday.

Consumers is now spending hundreds of millions of dollars to prevent portions of the unfinished, twin-reactor plant from sinking into soft soil.

James Keppler, NRC administrator for Region III, said the investigation was started last week after the

agency received documents from Dow Chemical Co. which detailed allegations of falsified test results. Those tests allegedly took place before 1978.

Michael Koschik, a Consumers Power spokesman, said that officials at the Jackson-based utility have always been forthright about the soil problems.

"No official of Consumers Power either intentionally or unintentionally withheld information about soil settlement from the NRC," Koschik said.

However, Koschik said he could not comment about possible actions taken by subcontractors working on the massive construction project.

"At that time, we were placing a lot more responsibility on the subcontractors," he said.

If the allegations are accepted as true by the NRC, the agency has wide discretionary authority that ranges from issuing heavy fines to waiving penalties.

The records under NRC review are part of a legal fight between Dow and Consumers. Those records purportedly show that the results of soil tests were misrepresented to the NRC, but it is unclear who allegedly falsified the information.

Since 1978, the utility has been struggling to find a solution to the soils problems involving a key building at the \$5.7-billion nuclear plant. The company began reinforcing the underpinnings in December 1982 and the complex task is about one-third completed.

Koschik said that Consumers reported the problems to the NRC within 24 hours after learning the

diesel generator building had sunk several inches. He said that was the first time the utility was aware the sinking affected a safety-related building.

The NRC's Office of Investigations in Washington is handling the inquiry, Keppler said.

Keppler, NRC's top Midwest official, said he personally is unaware of any fraud that might have occurred. Keppler also said he is not familiar with details of the probe.

"To the best of my knowledge there has been no falsification. But if there was falsification, it would be a matter that would be dealt with strongly," he said.

Please see CHARGES, Page A-2

CLOSE LOOK

Agency zeros in on Fermi

Probe could lead to new delays

By Michael A. Robinson
and Charlie Cain
News Lansing Bureau

LANSING — The federal Nuclear Regulatory Commission (NRC) is intensifying inspections of Detroit Edison Co.'s Fermi II nuclear power plant, which is nearing completion in Monroe.

Although no quality control problems have been discovered, the increased attention could lead to new delays and cost overruns at the \$3.07 billion Fermi facility, NRC spokesman Jan Strasma confirmed yesterday.

The agency usually steps up its scrutiny of nuclear plants as they near the final stages of construction, said Strasma. Fermi II is 98 percent complete and is slated to begin operating early next year — 11 years later than originally planned.

"WE ARE LOOKING for further assurance that the plant is being built properly," said Strasma. "If we uncover construction problems, then it could lead to delays or additional costs."

Increased inspections at the Fermi plant mean that NRC personnel are now deeply involved in both major nuclear power construction projects in Michigan.

Agency officials said yesterday they are investigating new allegations of soils settlement problems at Consumers Power Co.'s Midland nuclear power plant. The investigation focuses on allegations that Consumers may have acted improperly in 1977 when soils compaction work was tested at the plant site.

Consumers contends it did not know of the soils problem, which still threatens completion of the \$5.7 billion project until 1978 — after Dow signed a contract to buy steam from the Midland plant.

SOIL BENEATH some of the huge complex sunk excessively, and under orders from the NRC the utility is working on a costly project to remove the defective soil and replace it with concrete foundations.

Meanwhile, Edison officials said they are optimistic that construction of Fermi will not be delayed or halted as a result of the NRC's inspection program.

"We have said the plant is a good, safe plant," an Edison spokesman said.

Continued on Page 4A

Agency zeros in on troubled Fermi

Continued from Page 1A

"We believe our work can stand up to any close inspection."

The William H. Zimmer plant in Ohio was not so fortunate. Some \$1.7 billion had been spent and the plant was 97 percent complete when the NRC, citing a litany of quality control problems, halted construction in November 1982.

STRASMA SAID the halt came after a period of heavy NRC involvement at Zimmer, which included a \$200,000 fine slapped on the project because of safety problems. The Zimmer plant is now being converted to a coal-fired facility.

"In any large (nuclear) construction project, the last few months are a time when problems may surface," said Strasma. "But we are confident that there is nothing of the magnitude of Zimmer at Fermi."

"We have not imposed any fines or major stop work orders at Fermi. Their record has been fairly good."

He said that the new effort will bring inspectors from the NRC's Chicago regional office to the plant to lend assistance to inspectors already at the Monroe County construction site.

"WE MAY HAVE a dozen different inspectors at one time or another or even more," he said.

Strasma said his agency has reviewed copies of Edison's "safetam" exit interviews of all construction workers leaving the site. Those docu-

ments did not detail any major problems, he added.

In the Consumers case, charges were raised in response to documents obtained last week from Dow Chemical Co., a former partner in the Midland project. NRC officials want to know if the soils problem could have been detected in 1977 and not in 1978 as Consumers has maintained.

Dow, saying it was misled by Consumers, pulled out of the Midland program last July and is suing Consumers for more than \$60 million in

'We are looking for further assurance that the plant is being built properly'

damages. Consumers in turn seeks to recover some \$460 million it says Dow owes in cancellation fees.

A DOW SPOKESMAN said the information was requested by the NRC. He further stated that the information is part of documents the company prepared for its suit against Consumers.

"We contend in our suit that Consumers withheld material about the soil sampling from us at the time we entered into an agreement with them in 1978," said Phil Schneider.

Consumers' spokesman Thomas Holliday said the company still stands by its original statement that it was unaware of the soil problems until 1978.

Unit two ^{MDR 4/11/84} cost near \$4 billion

By JULIE MORRISON
Daily News staff writer

JACKSON — Unit 2 of the Midland nuclear plant is now expected to cost \$3.95 billion and should be in commercial operation by December 1986. Consumers Power Co. officials said Tuesday.

The cost is almost as much as the company's last estimate of the total tab for the twin-reactor nuclear project, now more than a decade behind schedule and billions of dollars over budget. Total cost of the project is now estimated at about \$5.5 billion.

Consumers also announced it was cutting its quarterly common stock dividend to 35 cents, down 28 cents or 44 percent from 63 cents. The dividend cut is expected to raise \$100 million a year to fund construction of the Midland project.

Consumers President John D. Selby announced the revised cost and schedule for shareholders at the utility's annual meeting. Consumers previously had estimated the whole project would cost \$4.43 billion and be completed by mid-1986.

The company's latest estimate did not include an update about Unit 1 of the plant, and the utility said its fate is on "indefinite hold."

The announcement raises the cost of Unit 2 from the \$2 billion has already invested in it and marks the fifth major revision in cost the company has made since the plant was announced in the late 1960s.

Consumers spokesman Michael Koschik said the company has invested \$3.2 billion in both units to date.

In announcing the schedule, Selby said Consumers will continue building the plant because of Michigan's future energy needs.

"We at Consumers Power have the obligation not only to provide the power to turn the wheels of today's industry but to meet the demands of the future as well," Selby said. "While economic forecasting is far from an exact science, by even the most modest forecasts, Michigan will need Midland's power before the end of this decade."

Selby said rates initially will have to increase to cover Midland's construction costs, but he added depreciation tax benefits in 10 years will reduce the price of electricity from the plant by 25 percent.

Selby said the cost and schedule revision were necessitated primarily by Dow Chemical Co.'s decision to terminate its contract to buy process steam from Unit 1 of the plant as well as the implementation of a Construction Completion Plan for the site. Approved by the federal Nuclear Regulatory Commission, the CCP outlines a method for completing the plant and assuring quality. The plan requires a reinspection of work already completed before new work can continue.

Consumers currently has a \$776 million rate hike request pending before the Michigan Public Service Commission. If approved, \$564.2 million or 27.7 percent of that amount would be charged to electric customers when Unit 2 goes on line and would represent the company's first return on its investment in the project. The rate hike request does not include costs for Unit 1.

The dividend reduction announced by Consumers applies only to common stock. Dividends on preferred and preference stock will be paid in full.

Selby said the dividend reduction is "in recognition of the uncertainty over Midland, the need to conserve cash and maintain a dividend that will in the future allow access to equity markets."

With the reduction in dividends, Consumers common stock now will pay yearly dividends of \$1.40 per share instead of \$2.52.

Selby also announced Consumers' net income increased 33 percent in the first quarter of 1984, the result of an unusually cold winter.

Consumers customers face even higher bills

BY KEITH NAUGHTON
News Staff Writer

MIDLAND — Because of the increase in the cost of one reactor at the Midland Nuclear Plant, Consumers Power Co. may have to increase a record rate hike request by almost 60 percent.

At a press conference at the plant today, a utility executive said Consumers' \$776 million rate increase request will have to rise in proportion to the new cost of one of the plant's reactors.

Consumers announced Tuesday the cost of just one unit of the plant will total \$3.95 billion and be completed in December of 1986. The utility's rate hike request, now before the state Public Service Commission, is based on that reactor costing \$2.5 billion.

"There will have to be a proportionate recovery in rates," said Stephen H. Howell, Consumers' executive vice president in charge of the Midland plant.

Howell said the utility is readjusting its figures and will change its request to the PSC in "a couple of months."

The utility will not predict the fate of the plant's other mothballed reactor, but now says it is building a "one-unit" project.

"We are now a single plant with construction going toward completion," said James W. Cook, a Consumers vice president.

The utility continues to maintain that electricity generated from the reactor that is on hold — called Unit 1 — will be needed by 1994.

Unit 1 was originally designed to provide steam to the Dow Chemical Co. of Midland. Dow pulled out of its contract to purchase the steam last summer and filed suit against Consumers.

The utility counter-sued, and is seeking a settlement in excess of \$460 million. Howell did not predict the suits will be settled out of court.

"We are not talking (with Dow)," he said. "They have not wanted to talk directly."

In figuring the new cost of the plant, Consumers has "set aside" the \$210 million it spent to build equipment that would have supplied steam for Dow. It hopes to recover double that amount through litigation, Howell said.

Saginaw News
April 11, 1984

Howell said it will not cost as much to complete Unit 1 than it will to complete the other reactor because they share common systems.

"We're keeping our options open on Unit 1... (but) concentrating on one plant reduces the financial strain," he said.

Howell said financing the plant is the utility's "major hurdle" for completing it, noting that obtaining financing from Wall Street has been difficult for utilities building nuclear plants.

"Certainly the climate is bad now," he said.

Howell said obtaining a license from federal regulators to operate the plant also will be a significant step the utility must make to complete the plant.

The utility is confident it can receive that license by the time it plans to load nuclear fuel on July 1, 1986. Its confidence is based on an intensive, government-ordered re-inspection program, which Consumers expects will cause 40 percent of the plant to be re-worked, Cook said.

600 acres burn at Camp Grayling

By Booth News Service

GRAYLING — Dry conditions were blamed for a fire Monday that burned 600 acres of grasslands at Camp Grayling, and state fire officials are warning that the potential for forest fires will remain high in Michigan until mid-May.

The Monday fire was ignited by a shell that was being destroyed on the mortar range.

Consumers starts ad campaign on TV

BY DAVID SEDGWICK
News Lansing Bureau

LANSING — Consumers Power Co., which is fighting to save the Midland Nuclear Plant, is mounting a televised advertising campaign emphasizing future electrical needs.

The company has hired the Birmingham-based advertising firm Stone, August & Co. to run the ad campaign. The agency developed two, one-minute spots.

Consumers is embroiled in a debate with state officials over the need for the \$5.7-billion nuclear plant. However, the ads do not actually mention the power plant or the company's financial troubles.

One top state official claimed Consumers' ad campaign is a waste of money.

"I am getting awfully weary of this," said Attorney General Frank Kelley, a longtime critic of the utility.

"It is imprudent, especially since most of this is propaganda that is trying to convince people that management is not at fault for all their problems," he added.

Kelley said the campaign will cost roughly \$600,000. Company officials declined comment on the campaign's cost.

Company spokesman Michael Koschik, however, said the TV ads do not deal directly with the issue of the Midland plant.

"The basic point is that Consumers Power has supplied energy to Michigan for nearly 100 years. We've always been able to plan for energy growth, and we can do so in the future," he said.

Consumers will pay for the campaign with corporate funds and will not charge ratepayers, Koschik said.

Both ads have a nostalgic note, showing a domestic scene from the turn of the century and an office setting in the 1930s. They allude to Consumers Power's approaching centennial in 1986, said Thomas Eicher, the ad agency's supervisory manager who is handling the campaign.

"Our approach is softer and less aggressive. They have a bit of nostalgia, leading into the (company's) centennial," he said.

The ads will run at least three weeks, and perhaps much longer. "It takes awhile to change public attitudes," Eicher explained.

The agency developed the campaign after conducting an opinion survey of Michigan residents. Eicher declined to disclose the survey's results.

Consumers has hired a second advertising agency to place ads in newspapers throughout the Lower Peninsula. Those ads contain more specific information about the state's energy needs, according to Koschik.

In the past, Consumers and other utilities have donated funds to pro-nuclear advertising campaigns. Last year, the company earmarked more than \$100,000 for the Committee for Energy Awareness, an industry group based in Washington, D.C.

The firm produced ads contending that nuclear energy is essential for a guaranteed supply of electricity. Those ads were aired on network television last year.

APR 3 1974

The Dow Chemical Company
ATTN: Mr. Harold Hoyle, Chairman
Radiation Safety Committee
1707 Building
Midland, Michigan 48640

Docket No. 50-264

Gentlemen:

This refers to the inspection conducted on March 6 and 7, 1974, by Mr. J. A. Finn of this office of activities authorized by License No. R-108 and to the discussion of our findings with Dr. Anders of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with plant personnel, and observations by the inspector.

No violations of AEC requirements were identified within the scope of this inspection.

In accordance with Section 2.790 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the AEC's Public Document Room, except as follows. If this report contains any information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

6505200221 2 pp.

OFFICE ▶	RO:III	RO:III	RO:III	RO:III	
SURNAME ▶	Finn/ls	Fisher	Allen	Kepler	
DATE ▶	4/01/74	4/01/74	4/01/74	4/01/74	

H9

APR 3 1974

The Dow Chemical Company

- 2 -

We will gladly discuss any questions you have concerning this inspection.

Sincerely yours,

James G. Keppler
Regional Director

Enclosure:
RO Inspection Rpt No.
050-264/74-01

cc w/encl:
Dr. O. U. Anders
Reactor Supervisor

bcc: RO Chief, FS&EB
RO:HQ (4)
L:D/D for Fuels & Materials
DR Central Files
RO Files
PDR
NSIC

OFFICE ►

SURNAME ►

DATE ►

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Operations Radiological Protection

RO Inspection Report No. 050-264/74-01

Licensee: The Dow Chemical Company
1701 Building
Midland, Michigan 48640

TRIGA Reactor
Midland, Michigan

License No. R-108
Category: F

Type of Licensee: 100 Kw, TRIGA (Non Pulsing)

Type of Inspection: Unannounced

Dates of Inspection March 6 and 7, 1974

Dates of Previous Inspection: September 20 and 21, 1973 (Operations)

Principal Inspector: J. A. Finn *J. A. Finn*

4-2-74
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: *W. L. Fisher*
W. L. Fisher, Senior Health Physicist
Facilities Radiological Protection
Section

4/2/74
(Date)

~~8508240228~~

SM.

SUMMARY OF FINDINGS

Enforcement Action: None.

Licensee Action on Previously Identified Enforcement Matters

None reported within the scope of the inspection.

Unusual Occurrences: None.

Other Significant Findings

A. Current Findings: None.

B. Unresolved Items: None.

C. Status of Previously Reported Unresolved Items: None reported.

Management Interview

The following individuals were present during the management interview:

Dr. O. U. Anders, Reactor Supervisor
Dr. J. W. Turley, Laboratory Director
Mr. L. G. Silverstein, Radiological Safety Officer
Mr. G. W. Engdahl, Health Physicist

The scope and findings of the inspection were discussed. The inspector stated that no items of noncompliance had been identified.

REPORT DETAILS

1. Persons Contacted

Dr. O. U. Anders, Reactor Supervisor
Mr. L. G. Silverstein, Radiological Safety Officer

2. Personnel Monitoring

Film badges are obtained from a commercial supplier on a monthly basis. The badges monitor beta, gamma and fast neutrons. Visitors are provided badges. Forms AEC-4 are not completed for reactor personnel. The badge suppliers' report is the equivalent of Form AEC-5.

Self-reading dosimeters are used as deemed appropriate. Ranges available include 0 to 200 milliroentgens and 0 to 1 roentgen. Results are recorded in the experimental logbook.

A review of film badge reports for 1971, 1972 and 1973 showed the maximum annual whole body exposure was 50 millirem. Skin exposures have been minimal. No reports had been received to date in 1974.

3. Surveys and Survey Instruments

The licensee has on hand survey instruments capable of measuring beta, gamma and neutrons. These are calibrated semiannually.

The reactor room sample storage area is surveyed daily. Surveys made during removal of experiments from the lazy susan or from the rabbit system are recorded in the experimental log books.

4. Rabbit System

The rabbit system is a closed system provided with a high efficiency particulate filter upstream from the blower. The blower exhausts into the hot laboratory hood exhaust pipe, which, in turn, exhausts through a high efficiency particulate filter to the roof stack.

The sender-receiver station is in the hot laboratory hood. A seal cover plate is in place during sending and receiving operations. The station is under vacuum relative to the pressure in the hood.

Rabbit samples are doubly contained. The sample is sealed in a plastic container, which is then sealed in a plastic outer container. Remote handling tools are available.

5. Radioactive Waste

Solid waste from the reactor consists mostly of spent demineralizer resins. About 10 gallons of resin are transferred annually to a licensed waste burial service. Activity consists mostly of sodium 24. In addition, a small quantity of liquids generated during chemical separations of experimental samples are "solidified" with vermiculite and shipped as solid waste. There is no liquid waste from the reactor pool.

Particulate gaseous effluents are measured by the continuous air monitor. There has been nothing above background, which is of the order of 10^{-14} microcuries per milliliter. Argon 41 concentration calculations in the SAR assuming continuous generations of argon are below Part 20 limits. However, the rabbit system is used only about 5 hours per week.

6. Area Radiation Monitor (Technical Specifications G.1 & G.2)

The area radiation monitor consists of a geiger tube mounted on the reactor room wall about 13 feet from the reactor, and a meter readout and alarm at the operating panel. The meter readout and alarm are shared with the water monitor. The area radiation monitor is calibrated semiannually with a 10 milligram radium source. The alarm is set daily at 1 milliroentgen per hour as part of the Daily Startup Checklist.

7. Water Monitor

Pool water is filtered and portions are demineralized. Prior to filtering, the water passes through a water monitor vessel containing a geiger tube. The signal is fed to the area radiation monitor-water monitor readout at the operation console. The readout represents the combined signals from both probes.

The water monitor is calibrated semiannually. The alarm is set daily at 1 milliroentgen per hour as part of the Daily Startup Checklist.

8. Continuous Air Monitor (Technical Specifications G.2 & G.3)

The continuous air monitor (particulate) is located in the reactor room with readout and alarm on the monitor itself. The monitor is operated in the fixed air sample mode. Each day as part of the Daily Startup Checklist, the filter is moved, the background is recorded (e.g. 50 counts per minute) and the alarm points are set. The low alarm is set at 1000 counts per minute (equivalent to about 2×10^{-11} microcuries per milliliter on an eight hour sample). The high alarm is set at 5000 counts per minute. The monitor is calibrated weekly with a beta source.

9. Records

The following records were reviewed for items concerned with radiation protection and radwaste:

- a. Daily Startup Check List
- b. Weekly Instrumentation Checklist
- c. Monthly Checklist
- d. Semiannual Checklist
- e. Reactor Operating Log
- f. Experimental Log
- g. Radiation Monitoring Instruments Calibration Book
- h. Film Badge Reports