Enclosure 6

INSPECTION RECORD

Region III

NMED no. **090855, 090439, 100143**
Inspection Report No. **2010-001** License No. **21-00265-06**
Docket No. **030-04783**

Licensee (Name and Address):

The Dow Chemical Company
H & ES Industrial Hygiene Laboratory
1803 Building
Midland, MI 48674

Location (Authorized Site) Being Inspected: **Central Research Campus, Midland, Michigan**

Licensee Contact: **James Weldy, CHP, RSO** Telephone No. **989-636-1440**

Priority: **3** Program Code: **03610**

Date of Last Inspection: **April 9, 2008**
Date of This Inspection: **July 22, 2010**

Type of Inspection: ( ) Initial (X) Announced ( ) Unannounced
( ) Increased Controls (X) Routine ( ) Special

Next Inspection Date: **07/2013** (X) Normal ( ) Reduced

Justification for reducing the routine inspection interval:

Summary of Findings and Actions:

( ) No violations cited, clear U.S. Nuclear Regulatory Commission (NRC) Form 591 or regional letter issued
( ) Non-cited violations (NCVs)
( ) Violation(s), Form 591 issued
(X) Violation(s), regional letter issued
( ) Follow up on previous violations

Inspector(s): Deborah A. Piskura Date 8/17/2010
Deborah A. Piskura, Health Physicist

Approved: Tamara Bloomer Date 8/18/2010
Tamara E. Bloomer, Chief, MIB

PART I-LICENSE, INSPECTION, INCIDENT/EVENT, AND ENFORCEMENT HISTORY

1. AMENDMENTS AND PROGRAM CHANGES:
(License amendments issued since last inspection, or program changes noted in the license)

AMENDMENT #	DATE	SUBJECT
86	**04/16/2010**	**name new RSC Chairman**
85	**03/22/2010**	**add Cm-244 & Am-241 in analyzer**
84	**01/25/2010**	**add L.C. for gauge service activities**
83	**09/09/2009**	**add L.C. for one-time service activity on gauge***
82	**07/29/2008**	**add new L.C.**

***Service activity to shield gauge and maintain the unit on-line due to the critical nature of the plant possess. Amendment requested to add a custom-made shield to the gauge as a temporary replacement for the failed shutter (reported by the licensee on 4/06/2009 in accordance with 10 CFR 30.50) until the gauge could be exchange by the device manufacturer.**

2. INSPECTION AND ENFORCEMENT HISTORY:
(Unresolved issues; previous and repeat violations; Confirmatory Action Letters; and orders)

No violations were identified during last two previous routine inspections conducted on April 9, 2008, and July 12, 2005 respectively.

3. INCIDENT/EVENT HISTORY:
(List any incidents, or events reported to NRC since the last inspection. Citing "None" indicates that regional event logs, event files, and the licensing file have no evidence of any incidents or events since the last inspection.)

This routine inspection included a review of three reportable events which the licensee reported to the NRC. The reported events and the licensee's subsequent investigation into each incident are summarized below:

Lost/missing vial containing C-14 from the facility's storage lab (10 CFR 20.2201(a)). In letter dated April 27, 2010, the licensee's RSO reported the loss of vial containing liquid C-14 (a quantity less than 1000 times the Appendix C value for C-14) which was discovered on Feb. 26, 2010, while the radiation safety staff performed the annual physical inventory of all licensed material in its possession. The vial was last accounted for in its approved storage location during February 2009 physical inventory. Sometime between March 2009 and February 2010, the vial was lost. Interviews with laboratory staff and a search of the laboratory could not determine the whereabouts of the vial, when it was last used, etc. Reviews of the waste disposal records also provided no information on the location or disposal of the vial. The RSO believed that while the staff performed the 2009 annual inventory, the vial was inadvertently placed with waste intended to be disposed of by incineration and not recorded on the disposal form. The vial was

most likely incinerated.

The licensee implemented several corrective actions to prevent recurrence:
(1) Radwaste containers will be labeled with a radiofrequency identification tag to track the wastes for inventory purposes
(2) Physical inventory and disposal will be performed as separate tasks at separate times
(3) Records of disposal will be reviewed by a second individual to verify accuracy and completion
(4) In the future, the licensee intended to use a color-code system for liquid wastes to clearly identify radwaste from non-radwaste.

The written report (ML091250587) contained all the required information.
One violation of NRC requirements was identified. The licensee's failure to secure for unauthorized removal or access the vial containing the carbon-14 that was stored in a controlled area was a violation of 10 CFR 20.1801. Due to the low actual safety significance associated with the small amount of material, the fact that the quantity was less than 1000 times the 10 CFR Part 20, Appendix C value, and the licensee had a functional radiation safety program, this violation would be categorized as a Severity Level IV violation.

Leaking Po-210 source (10 CFR 30.50), with subsequent contamination in a lab. On 11/2/2009, the RSO discovered that a leak test sample submitted by a laboratory had contamination levels in excess of the limits specified in License Condition 12. The RSO's investigation revealed that the laboratory staff had used and cleaned the static eliminator device inconsistent with recommendations of the device manufacturer. The laboratory used the device to remove static from a chemical agent aerosol stream. *Note according to discussions with the device manufacturer, the device was intended and designed to eliminate static from air.* In addition, the staff periodically cleaned the device by rinsing it with water. By exposing the device to the chemical agent combined with the water rinse, the resulting solution was acidic and evidently corrosive to the Po-210 plated source. The RSO performed surveys of the laboratory and found contamination or the potential for contamination in several areas. The licensee performed decontamination of selected areas and equipment and then collected other equipment for disposal. The radiation safety office decontaminated the accessible areas and equipment. According to the licensee's survey report, all areas are free of contamination. The static eliminator device was returned to the manufacturer for disposal. The written report dated 11/20/2009 (ML093270303) contained all the required information. As corrective action, the licensee instituted a policy not to use static eliminator devices for aerosols, liquids, etc. In addition the principle investigator of the lab instructed his personnel on the proper cleaning methods for static eliminator devices. This is an open item pending additional NRC review.

A gauge shutter failed in the open position, preventing the shutter to be closed during a routine safety check (10 CFR 30.50) On 4/6/2009, while the licensee was performing a routine shutter check, the shutter handle broke, preventing the shutter mechanism to close in the shielded position. Due to the integral nature to the gauge to the plant's operations, the licensee requested an amendment to its

licensee to build a temporary shield, with the gauge on-line and the shutter open, until a scheduled shutdown in September 2009. The amendment request (No. 83) was approved on 9/9/2009. During the shutdown, the device manufacturer removed the damaged gauge and exchanged the unit a new gauge. The licensee stated that the cause of the shutter handle failure was attributed to a defective weld, as well as, the age of the unit (c. 1986) combined with exposure to the elements. The licensee's written report dated 5/4/2009 (ML091250587) contained all the required information. No violations of NRC requirements were identified.

PART II - INSPECTION DOCUMENTATION

1. ORGANIZATION AND SCOPE OF PROGRAM:
(Management organizational structure; authorized locations of use, including field offices and temporary job sites; type, quantity, and frequency of material use; staff size; delegation of authority)

This licensee was a large industrial chemical company employing 4,000 individuals at its Midland, Michigan facility. The company operated a Type A broad scope R&D program. The Radiation Safety Office was staffed with a dedicated, full-time RSO, one HP technician, as well as, secretarial and support members. The licensee established a radiation safety committee (RSC) which reviewed and approved users, uses and facilities. Carbon-14 and hydrogen-3 were used for in vitro and limited animal research and development in approximately 20 laboratories. Approximately 100 individuals were approved by the RSC as authorized users of licensed material. The radiation safety office performs monthly audits and confirmatory/compliance surveys of its labs.

The licensee was authorized to dispose of its licensed material (laboratory wastes, liquid wastes, paper, gloves, etc. contaminated with C-14 and/or H-3) using its incinerator under the provisions of License Condition 18. The licensee is also authorized to incinerate radwaste for its other Dow Facilities.

The majority of licensee's activities involved specifically fixed gauging devices containing Cs-137, Kr-85 or Am-241 sources. The gauges were used for level and thickness measurements at numerous locations within the plant. The licensee also possessed portable gauges analytical analyzers, gas chromatographs and static eliminators.

One violation of NRC requirements was identified during this inspection for the licensee's failure to maintain control of a vial containing C-14.

2. SCOPE OF INSPECTION:
(Identify the inspection procedure(s) used and focus areas evaluated. If records were reviewed, indicate the type of record and time periods reviewed)

Inspection Procedure(s) Used: **87126**

Focus Areas Evaluated: **03.01 - 03.07**

3. INDEPENDENT AND CONFIRMATORY MEASUREMENTS:
(Areas surveyed, both restricted and unrestricted, and measurements made; comparison of data with licensee's results and regulations; and instrument type and calibration date)

The inspector performed independent surveys at selected gauge units, and in selected research laboratories and the gauge storage area. All survey measurements were comparable to the licensee's survey results.

4. VIOLATIONS, NCVs, AND OTHER SAFETY ISSUES:
(State the requirement, how and when the licensee violated the requirement, and the licensee's proposed corrective action plan. For NCVs, indicate why the violation was not cited. Attach copies of all licensee documents needed to support violations.)

One violation of NRC requirements was identified during this inspection:

10 CFR 20.1801 requires that the licensee secure from unauthorized removal or access licensed materials that are stored in controlled or unrestricted areas.

Contrary to the above, between March 2009 and February 2010, the licensee did not secure from unauthorized removal or limit access to a vial containing carbon-14 located in the storage refrigerator located within the 1803 Building, which is a controlled area.

This is a Severity Level IV Violation (Supplement IV).

5. PERSONNEL CONTACTED:
(Identify licensee personnel contacted during the inspection, including those individuals contacted by telephone.)

#*Jerry Cassiday, Health Physics Technician
Jon Hotchkiss, Ph.D., Chemist
***Susan Ripple, M.D., Ph.D., Leader, Industrial Hygiene**
#*Dan Rader, Site Responsible Care Leader, Environmental Health and Safety
Mary Scherzer, Chemist
#*James Weldy, CHP, RSO

Doug Davis, RSO, NRD, Inc.

Several laboratory personnel and authorized gauge users were also contacted during this inspection.

Use the following identification symbols:
Individual(s) present at entrance meeting
* Individual(s) present at exit meeting