0012620 (C)

RECEIVED
JUN 13

CORRES. CONTROL
OUTGOING LTR. NO.

89 RF 1661

DIST.	LTR	ENCL
SANCHINI, D. J.	X	X
BADER, C. P.		
ERFURDT, R J.	X	X
HEINTZ, E R.		
HOOD, R. C.		
IOEKER, E H	X	X
KINZER, J. E.		
KIRBY, W. A.		
McNETT, J.F.		
MEYERS, G.W.		
ROECKER, J.H.		
SHANNON, W.M.		
SMITH, R.E.		
WESTON, W.F.		
WOZNIAK, B.D.		
YOUNG, E.R.		
BETCHER, D.H.		
CARNIVAL, G.J.		
FERRERA, D W		
HARMAN, L.K.		
HEBERT, J.L.		
HOEY, J.B.		
HOFFMAN, R.B.		
KLAMANN, R L.		
KRIEG, D M.		
LOUDENBURG, G.E.		
McKINLEY K B.		
NAIMON, E.R.		
NEWBY, R.L.		
TURNER H L.		
VELASQUEZ, R.N.		
CORRES. CONTROL	X	X
D. ERDPE	X	X
G. MCGINNIS	X	X
J.M. ORTIZ	X	X
L.R. CRISLER	X	X
J MORRISON	X	X
K. TALMAN	X	X
R. RICHARDELLI	X	X
J. D. WEAVER	X	X
T. J. TGGELER	X	X
G. SETLOCK	X	X

CLASSIFICATION
UNCLASSIFIED
CONFIDENTIAL
SECRET

AUTH. CLASSIFIER SIG.

DATE

IN REPLY TO LTR. NO.

INT 89-5-460

LTR APPROVALS
RER - [illegible]
MFH - [illegible]

ORIG & TYPIST INITIALS
JEM-BLC 1/17

Rocky Flats Plant
Aerospace Operations
Rockwell International Corporation
P.O. Box 464
Golden, Colorado 80402-0464
(303) 966-7000
Contractor to U.S. Department of Energy

Rockwell International

SAFETY ANALYSIS

00002469O

89-RF-1661

JUN 13 1989

Rush O. Inlow
Acting Area Manager
DOE/RFAO

Attn: R. J. Schassburger - Environment, Safety & Health

INTERIM - UNUSUAL OCCURRENCE REPORT [UOR], RFP 89-5--460 89-1, "CLEAN ROOM SPILL"

Enclosed is the Interim Report for the subject UOR. This report was prepared in accordance with DOE Order 5000.3, "Unusual Occurrence Reporting System".

R. J. Erfurdt

R. J. Erfurdt, Director
Health, Safety & Environment

Orig. and 3 cc - R. O. Inlow
Enc.

cc:
T. A. Lachman - DOE/RFAO

ROCKWELL INTERNATIONAL

ROCKY FLATS PLANT

INTERIM REPORT

UOR RFP 89-5--460 89-1

CLEAN ROOM SPILL

Prepared By:

HS&E SAFETY REVIEW GROUP

Prepared by: J. E. Morrison
Approved by: M. F. Hickey, Manager

ROCKWELL INTERNATIONAL
ROCKY FLATS PLANT

1. UOR # RFP 89-5--460 89-1

   CLEAN ROOM SPILL

2. STATUS & DATE:

   INITIAL May 18, 1989
   INTERIM ~~JUN 1 5 1989~~

3. DIVISION OR PROJECT:

   DP - Rockwell International, AERO, Rocky Flats Plant
   Assembly Cleaning 460

4. FACILITY, SYSTEM, OR EQUIPMENT:

   RI - Assembly Cleaning, Room 158, Tanks 4 and 6, and the portable acid waste vessel, east side of Building 460.

5. DATE OF OCCURRENCE:

   April 10, 1989

6. TIME OF OCCURRENCE:

   1830 Hours

7. SUBJECT OF OCCURRENCE:

   PM Shift assembly operators were in the process of draining the rinse water in Tank 6 into the portable acid waste dumpster outside the building. The portable acid waste dumpster overflowed onto the ground and into the storm drain.

8. APPARENT CAUSE: [P=Primary Cause - S=Secondary Cause - T=Tertiary Cause]

   DESIGN P MATERIAL ___ PERSONNEL S PROCEDURE T OTHER ___

REVIEWED FOR CLASSIFICATION (U)
By: [signature]
Date: 6-12-89

3/17

9. DESCRIPTION OF OCCURRENCE:

Day Shift operations drained and rinsed Tanks 4 and 6. The work was scheduled in preparation to replace the leaking drain valves and nitric and nitric/nitrad acid solutions. The drained solutions were collected in a portable acid waste dumpster which is located outside and on the east side of Building 460. After the transfer was made, the Day Shift foreman closed the fill valves on the portable acid waste dumpster. He recorded the estimated volume that was transferred into the Log Book which is kept at his desk.

On April 10, 1989, Day Shift Maintenance replaced the drain valves, but were unable to connect the electrical portion which allowed the valves to be closed electronically. The valves were operable in the manual mode only.

The PM Shift foreman was given verbal instructions by the Day Shift foreman to fill Tanks 4 and 6 with new nitric and nitric/nitrad acid solutions. These instructions were verbally conveyed by the PM Shift foreman to the PM Shift assembly operators at approximately 1630 hours. The PM SHift foreman then left the area.

Before filling Tank 6, the assembly operators noticed that approximately 4-8 inches of liquid remained in the tank. They went outside to open the fill valves on the portable acid waste dumpster. The assembly operators were not aware the valves on Tank 6 were functional in the manual mode only, so one of the operators went back to the control panel in Room 158, to electronically open the valve. The assembly operator notified the PM Shift foreman by telephone when he noticed the solution did not drain. The foreman told the operator that the valve must be opened manually. The assembly operator then opened the valve manually and watched the solution drain out of Tank 6.

While Tank 6 was draining, an assembly operator began to fill Tank 4 with water. Another assembly operator went outside to pick up a pump off the dock. While there, he noticed the portable acid waste dumpster was overflowing. He immediately notified the assembly operator in Room 158. The assembly operator in Room 158 closed the drain valve to Tank 6. The operator then went over and shut off the water running into Tank 4 stopped. The PM Shift foreman was notified.

The foreman examined the spill area and noticed a discoloration in the snow outside the berm, indicating a leak. The solution was flowing into a storm drain approximately 75 feet southeast of the area. The foreman placed two "pig product" [a material manufactured for absorbing and blocking spilled liquids] in the drainage path between the berm and storm drain, then contacted the Plant Shift Superintendent, and called the Day Shift foreman at his home.

4/17

After arriving at the scene, the Shift Superintendent called the Fire Department Hazardous Material [Haz Mat] Team, Environmental Management, and Maintenance. The Haz Mat Team removed the snow from the berm area and found a hole in the berm. Solution was flowing through this hole and running down the asphalt into the storm drain which flows to the Plant Sewage Treatment Facility. NO!

The Haz Mat Team plugged the hole in the berm, formed a dike around the drain with "pig product". They covered the spill area with "X-A Acid Neutralizer" to neutralize any acid that might be present. At 2200 hours, the Shift Superintendent directed that the spill area be roped off to restrict access.

On April 11, 1989, all processing operations in Room 158 were suspended by the Building Manager until cause of the incident could be determined and corrective actions implemented.

The Day Shift assembly operators began cleaning the spill using water and "Wet-Vac" vacuum cleaners on April 11, 1989. The clean-up was completed by the PM Shift, approximately 1730 hours. Restart of processing operations was approved by the Building Manager on April 12, 1989.

The amount of spill that ran down the storm drain was estimated to be approximately 8-9 gallons.

---

10. OPERATING CONDITIONS OF FACILITY AT TIME OF OCCURRENCE:

Scheduled quarterly replacement of the nitric and nitric/nitrad acid solution as defined in the "M" document [defining frequency of acid change].

---

11. IMMEDIATE EVALUATION:

The nitric and nitric/nitrad acid solutions in Tanks 4 and 6, replaced on a quarterly basis as identified in the "M" documents. These "M" documents identify the frequency of rinse solution replacement, but do not identify job steps or controls required in replacing the solution. Assembly operators not familiar with the procedure for draining or filling tanks should be provided with written instructions. Other shifts should be notified of operating conditions out of the norm [temporary operating changes, incomplete maintenance, etc.].

The capacity of the cylindrical-shaped portable acid waste dumpster is about 200-gallons. There is no visual means for determining the liquid level. The dumpster is equipped with a high level probe that is designed to alarm at the control panel in Room 158, but failed. Both fill and drain outlets located at the top of the tank and connected by hoses when in use. The fill valves are not controlled, so solutions could be transferred to the tank without recording the volume deposited.

5/17

The berm was initially constructed as a secondary containment for spills. This area is unprotected from the weather, so it collects snow, building run-off, and wind blown trash. Construction of a roof over the area was not installed because of lack of funds. Resource Conservation and Recovery Act [RCRA] criteria do not require secondary containment since the acid waste dumpster is portable. A Maintenance Work Order was written sometime in April 1988, requesting the berm be removed. Instead, a hole was drilled through the berm.

ENV. MGT. DOES!

The portable acid waste dumpster is equipped with a high level probe that alarms at the control panel located in Room 158. The alarm failed to activate when the tank was over-filled. Electrical wires to the probe must be disconnected each time the portable tank is moved. There are no written procedures for testing the alarm to insure that it is functioning after each move.

The assembly operators on PM Shift received verbal instructions to fill Tanks 4 and 6 with nitric and nitric/nitrad acid. Finding liquid already in the tanks, they drained them without notifying their foreman. As they added water, they saw a residue washing off the heater coil and decided to rinse out the tank. This deviation from the verbal instructions they had received was not conveyed to their foreman.

12. IMMEDIATE ACTION TAKEN AND RESULTS:

Operations in Room 158 were shut-down until cause of the spill was determined.

Valve locks were installed on the fill valves to the portable acid waste vessel with key access controlled by management.

A faulty control card was found and replaced when the high level detection system on the portable acid waste vessel was tested.

A liquid volume status log was installed in the operating area that provides the operators an estimate of current liquid volume in the portable acid waste vessel.

13. IS FURTHER EVALUATION REQUIRED:

YES___ NO_X_

14. FINAL EVALUATION AND LESSONS LEARNED:

To be included in the Final Report.

6/17

15. CORRECTIVE ACTION:

TAKEN:

1. Operating procedure OP-1003B was revised and implemented May 1, 1989. This procedure identifies necessary job steps required to drain, flush, and replace rinse solutions in the "clean room" rinse tanks.

BY: G. H. McElhinney
Operations Manager Building 460

WHEN: May 1, 1989

2. A log sheet reflecting volume status of the portable acid waste dumpster was implemented May 1, 1989. This log is posted in the "clean room", room 158, which is the assembly operators work area.

BY: G H. McElhinney
Operations Manager Building 460

WHEN: MAY 1, 1989

3. Valve locks were installed on the portable acid waste dumpster fill valves April 13, 1989. Key for the valve locks are under control of shift foreman. A three man rule [two operators and shift foreman] are required for all liquid transfers to portable acid waste dumpster. This operation is included in operating procedure OP-1003B, revised May 1, 1989.

BY: G. H. McElhinney
Operations Manager Building 460

WHEN: April 13, 1989

4. A formal meeting was conducted, April 14,1989, with all three shifts. This meeting reviewed the necessity of maintaining good communications to ensure both assembly operators and management are aware of current operating conditions.

BY: G. H. McElhinney
Operations Manager Building 460

WHEN: April 14, 1989

7/17

5. A test was preformed by maintenance to determine cause for failure of the high level detection system on the portable acid waste dumpster. Testing identified failure of a controller card in the electrical detection system. Defective controller card was replaced.

BY: G. H. McElhinney
Operations Manager Building 460

WHEN: April 12, 1989

[deliberately blank]

8/17

15. CORRECTIVE ACTION:

RECOMMENDED: A Facilities Engineering task team is in place to evaluate current instrumentation used plant wide for detection of liquids. This task team should include the alarm systems currently used on all portable liquid dumpsters at Rocky Flats and make recommendations for replacement or upgrades as required. The task team should also evaluate and recommend testing procedures and frequency of testing.

1. TO: T. A. Hughes
Manager, Control Systems Development

EVENT: Portable acid waste dumpster high level liquid detection system failed to activate, alarming personnel that the portable acid waste dumpster was full.

CAUSE: Solution overflowed from portable acid waste dumpster into berm area.

CORRECTIVE ACTION: The Facilities Engineering task team is chartered with corrective action #4.2.1.2 in the Chromic Acid Incident Corrective Action Plan, to review and evaluate causes for level sensor failures and provide recommendations for reliable level sensors.

WHEN: October 30, 1989

T. A. Hughes DATE 6-5-89

[deliberately blank]

9/17

15. CORRECTIVE ACTION:

RECOMMENDED: The acid waste dumpster vents to the atmosphere, consequently any overfilling of the dumpster will flow into the berm area. Some type of check valve [ball check] could be installed on the vent that would shut off if liquids start to overflow.

2. TO: M. L. Johnson
Engineering Design Group Manager

3. TO: G. H. McElinney
Operations Manager Building 460

EVENT: Portable acid waste dumpster overflowed into berm area.

CAUSE: Assembly operators were unaware of solution volume in portable acid waste dumpster.

CORRECTIVE ACTION: Operations Manager Building 460 will issue a work order for engineering support and instillation of an overflow control device to be installed on the portable acid waste dumpster.

WHEN: Engineering will issue the design package to Maintenance on July 31, 1989. Operations Manager Building 460 will status progress of installation August 1, 1989

M L Johnson DATE 6-5-89

G. H. McElinney DATE 6-7-89

[deliberately blank]

10/17

15. CORRECTIVE ACTION:

RECOMMENDED: A Facilities Engineering waste tank task team is in place evaluating all waste tanks in use on plant site. This task team should include all portable liquid dumpsters in their evaluation. Their evaluation of portable liquid dumpsters should include, their use, possibility of discharging to environment, need for secondary containment, and appropriate weather protection. Corrective actions should be identified and initiated.

4. TO: M. L. Johnson
Engineering Design Group Manager

EVENT: Overflow from portable acid waste dumpster collected in berm area and ran into storm drain.

CAUSE: A hole drilled in the berm allowed waste solutions to drain into a storm drain.

CORRECTIVE ACTION: The engineering task team has been assigned task "T.S.7" in the Technical Safety Appraisal to evaluate all bulk storage of hazardous materials plant wide. The task team is to establish a new plant standard for the storage of these materials.

WHEN: September 29, 1989

M L Johnson DATE 6-1-89

[deliberately blank]

11/17

16. PROGRAMMATIC IMPACT:

None.

17. IMPACT UPON CODES AND STANDARDS:

None.

18. SIMILAR UNUSUAL OCCURRENCE REPORT NUMBERS:

Manual search through Rockwell International, Rocky Flats Plant, files found no similar occurrences.

[deliberately blank]

12/17

19. SIGNATURES:

J. E. Morrison, Facilitator
Safety Review Group — Date 6/7/89

G. H. McElhinney, Cognizant Supervisor — Date 6-1-89

K. G. Tallman, Responsible Management — Date 6-5-89

Reviewed By:

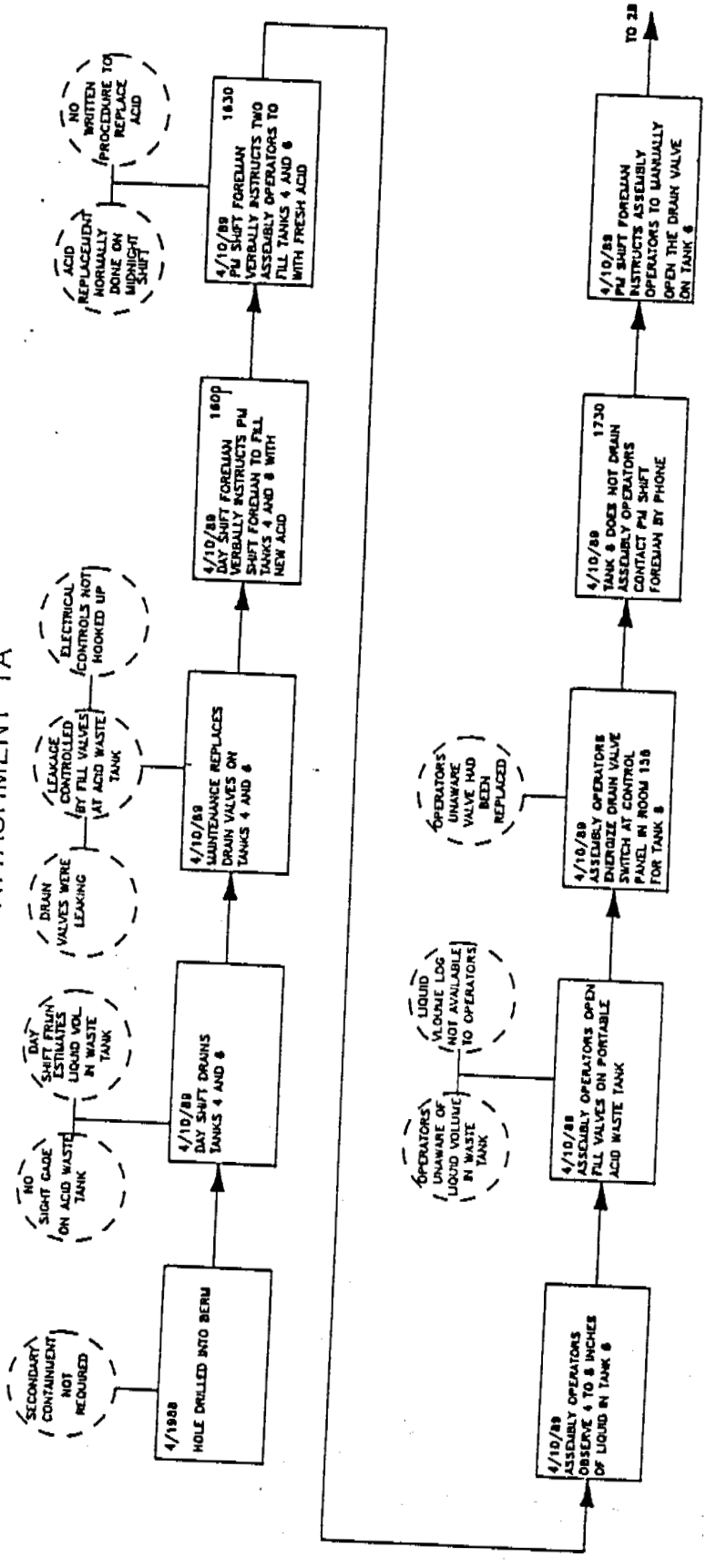
T. O. Tegeler, Representative
Union Safety Committee — Date 6.1.89

APPROVED BY:

Margaret B. Hickey, Manager
Safety Review Group — Date 5/31/89

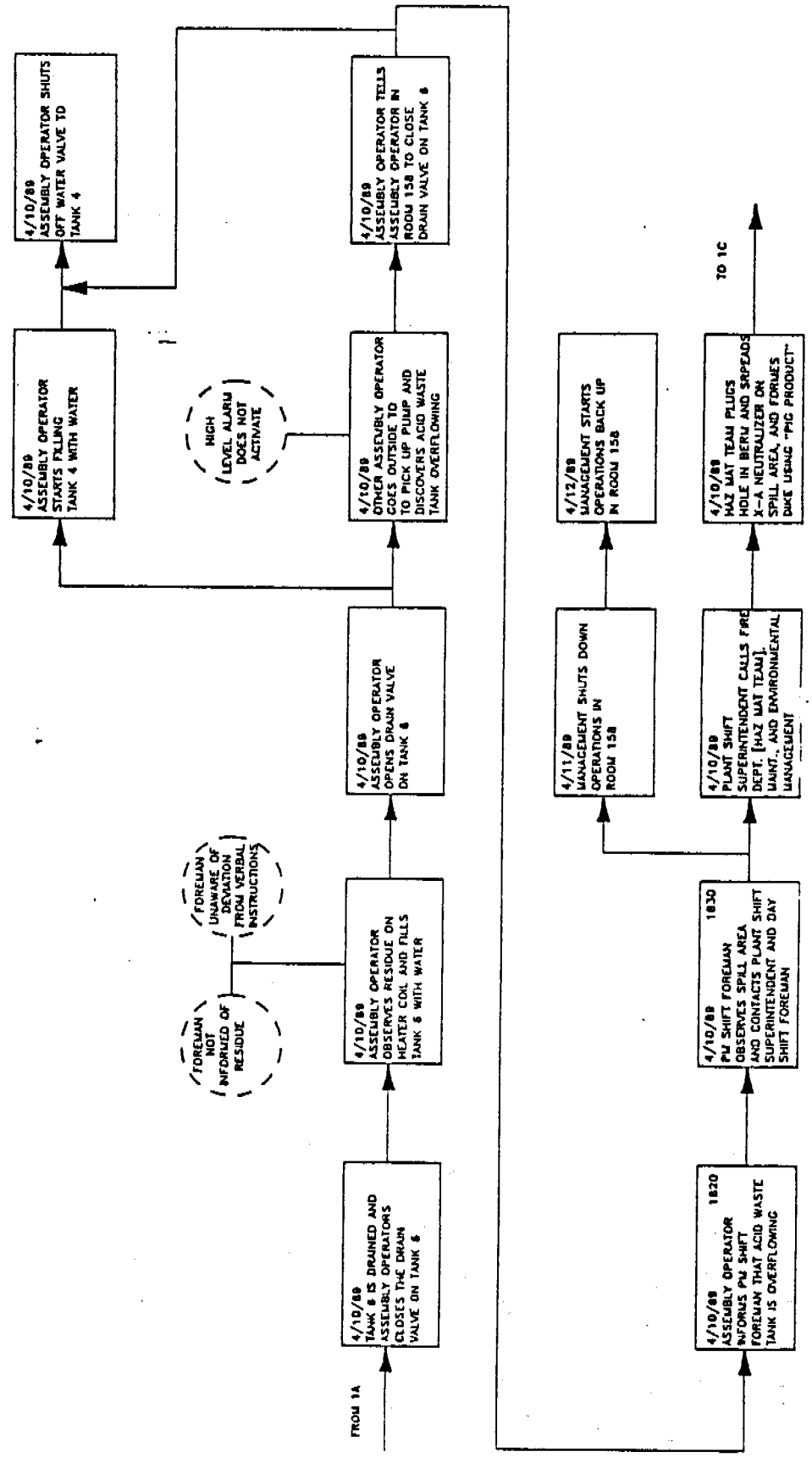
13/17

UOR 89-5--460 89-1
CLEAN ROOM SPILL
SEQUENCE OF EVENTS/CAUSAL FACTORS
ATTACHMENT 1A



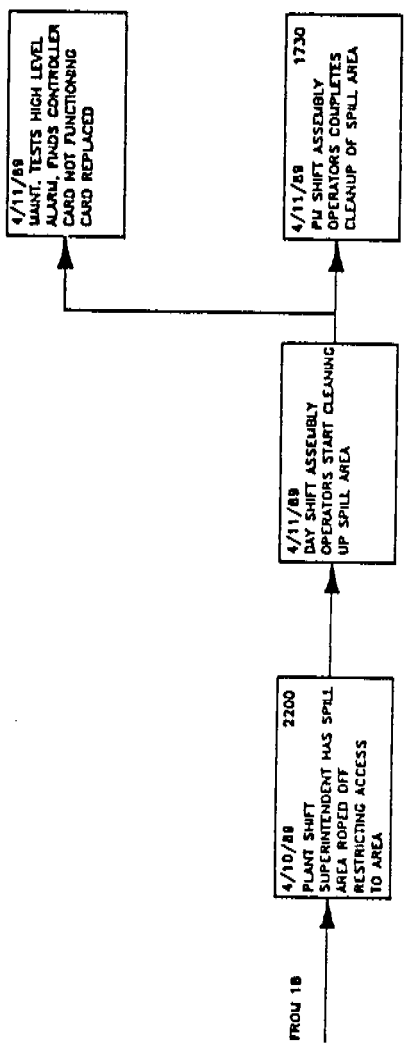
4/17

UOR 89-5--460 89-1
CLEAN ROOM SPILL
SEQUENCE OF EVENTS/CAUSAL FACTORS
ATTACHMENT 1B



15/17

UOR 89-5--460 89-1
CLEAN ROOM SPILL
SEQUENCE OF EVENTS/CAUSAL FACTORS
ATTACHMENT 1C



11/17

UOR 89-5--460 89-1
CLEAN ROOM SPILL
ENERGY TRACE AND BARRIER FAILURE ANALYSIS