OCCUPATIONAL HEALTH AUDIT
(July 7, 1994)

AUDIT TEAM:	Bruce Heinze, Jackie Paul, Dave Albert, Howard Wilkinson
PLANT IH CONTACT:	Marty Morrison
ATTENDANCE:	Joe Rawlings, Roger Hudson, Ken Fox, Buck Bailey, Eddie Supple
WRITER:	Maralee Marchant

GENERAL INDUSTRIAL HYGIENE/MEDICAL

The I.H. Manual is complete, however, most written programs need to be reviewed and updated as needed. Eating facilities and equipment were clean. Industrial hygiene training was conducted by the shift supervisors on a quarterly basis. The Block Indoctrination video was updated in fall of 1993 and covers the chemical and physical hazards in the block.

Recommendations:

M 1. The 1993 CPAI is being added to the computer database and needs to be updated for 1994.

HAZCOM PROGRAM

Power I/Utilities employees receive HAZCOM training annually. The 1993 training was performed quarterly by the shift supervisors. The labeling of plant equipment was good. The HAZCOM/MSDS notebooks are readily available in the control room.

Recommendations:

M 1. The written HAZCOM program needs to be reviewed and updated (written program, chemical list, vessel ID/cross reference table, current MSDSheets).

M 2. There are a few bottles in the lab which need labels to comply with Dow Hazard Communication labeling requirements.

HEARING CONSERVATION

Annual training was conducted during 1993. The Power 1 block is posted as a hearing protection required area. The Utilities block is posted as needed. Also, high noise areas in the process area are posted with appropriate double hearing protection signs.

Recommendations:

M 1. The protective equipment requirements for operating the shop pedestal grinder need updating to include the use of hearing protection.

RESPIRATORY PROTECTION

The plants written Respiratory Protection Program is current (5/94), training was conducted third quarter 1993 by shift supervisors. The plant respirator cleaning station located in 2801 is posted and equipped with the necessary supplies. We support your decision to move the Life Air units to the permit writer's office at the Utilities plant to assure maintenance.

Recommendations:

M 1. The Scott-Acme respirator needs to be added to the written respiratory program.

PERSONAL PROTECTIVE EQUIPMENT

The plant's written program is current for 1994.

Recommendations:

No recommendations at this time.

ERGONOMICS

Recommendations:

No recommendations at this time.

THERMAL STRESS

Recommendations:

No recommendations at this time.

VENTILATION

The laboratory fume hoods are equipped with flow sensing devices and are checked quarterly. The last comprehensive hood survey was performed in December 1992. The housekeeping in the labs and the hoods was good.

Recommendations:

M 1. Analyzer shack (2825) needs to have the exhaust fan repaired.

WELDING

Signs were posted describing the health hazards of welding. Sources of ventilation for the welding area include wall fans at each end of the building at Power 1, one wall fan at Utilities, and large doorways.

Recommendations:

No recommendations at this time.

ASBESTOS

Inventory of asbestos-containing material was available for 1993 and 1994. Annual training records were documented for 1993.

Recommendations:

M 1. The gasket storage area in the Power 1 and the Utilities plant need to be vacuumed.

M 2. The non-asbestos material needs to be removed from the disposal dumpster.

ELECTRICAL RELIABILITY AUDIT SUMMARY

(May 3, 4, 5, 1994)

AUDIT TEAM: Mike Gee

PLANT CONTACT: Gary Landry

WRITER: Mike Gee

The electrical reliability audit for the Power I plant was conducted in May, 1994 as per the Five Point Electrical Reliability Program.

Those items identified with an index of 4 or higher in the Electrical Reliability report need some attention and a response. Please refer to the report.

The overall condition of the electrical assets of Power I reflects a commitment to continuous improvement. The audit team finds Power I has an overall average condition.

Recommendations: **Power I**

HR 1. 30 - 40% of junction boxes not properly grounded. Ground junction boxes, bond back panels, and conduits per L7C-0101-00 3.5.1. Train block electrical personnel in proper grounding practices.

HR 2. 50-60% of motors are improperly grounded. Ground motors per L7C-0101 5.4 and detail L7C 0118-01. Train block electrical personnel in proper grounding practices.

M 3. Material stored in clearance zone required by National Electric Code. Move material to give required clear access zone. NEC 110-16, 110-34.

Recommendations: **Utilities**

HR 1. 30 - 40% of junction boxes not properly grounded. Ground junction boxes, bond back panels, and conduits per L7C-0101-00 3.5.1. Train block electrical personnel in proper grounding practices.

HR 2. 30-40% of motors are improperly grounded. Ground motors per L7C-0101 5.4 and detail L7C 0118-01. Train block electrical personnel in proper grounding practices.

M 3. Material stored in clearance zone required by National Electric Code. Move material to give required clear access zone. NEC 110-16, 110-34.

CHEMICAL EXPOSURE INDEX REVIEW

(July 15, 1994)

AUDIT TEAM:	Greg Nesmith, Buck Bailey
PLANT CONTACT:	Marty Morrison
ATTENDANCE:	Roger Hudson, Joe Rawlings, Ken Fox, Howard Wilkinson, Eddie Supple
WRITER:	Greg Nesmith

The pre-audit review for the Chemical Exposure Index (CEI) was completed on Monday, July 11, 1994. The following people participated and represented their respective areas: Greg Nesmith, CEI; Marty Morrison, Power I/Utilities; Buck Bailey, Safety and Loss Prevention. The pre-audit simply consisted of a discussion of the CEI calculations, a short review of the previous audit, and an overview of the changes in the plant since the last audit.

During the course of the pre-audit, the only significant events revolved around the CEI calculations themselves. First, aqueous hydrogen chloride (HCl) is a concern at the Utilities plant; however, the present CEI calculation method is not suited for vapor-liquid solutions. Data for anhydrous HCl could be used but would be much too conservative (CEI of more than 700) since it is a vapor at ambient conditions. To compensate, the physical properties of water were substituted to model the solution. Vapor pressure data was based on experimental data for aqueous HCl. The resulting CEI of 9 was assumed to be more accurate based on past experience with aqueous HCl spills.

On a related note, a slight problem with the Excel spreadsheet program which has been developed for this calculation was discovered in the process of calculating the CEI of chlorine at Utilities. In this program, the total amount released is based solely on the rate of release. The amount contained at the source of the release is not taken into consideration. Hand calculations were completed to compensate for this problem. The CEI for chlorine at Power I/ Utilities was 378.

ACCOMPLISHMENTS/MAJOR CHANGES SINCE LAST REVIEW:

The P&ID's have been upgraded since the last CEI review to reflect existing operations although the effort is not yet 100% complete.

Recommendations:

M 1. Documentation: Continue updating P&ID's to represent existing operations. Once the P&ID's are up to date, implement a method for recording all changes.

Note: Although the CEI for chlorine at Power I/ Utilities is high enough to recommend a HAZOP review, such action should be postponed at this time. Since these chlorine cylinders are common throughout Dow, a single HAZOP should be conducted for ALL chlorine cylinders rather than redundant doing one for each plant. Power I/ Utilities will be notified if their assistance is needed in such a process and if any recommendations result from such a review.

LOSS PREVENTION/FIRE

(Friday, July 15, 1994)

AUDIT TEAM: Buck Bailey, Bill Franklin, Greg Nesmith

PLANT CONTACT: Marty Morrison

WRITER: Buck Bailey

The Loss Prevention recommendations from the previous Consolidated Audit have been properly addressed, and the Power 1 and Utilities plants appear to be in good condition with no serious loss prevention concerns.

I appreciate the pre-audit activities and preparations by the plant staff.

Following are a few items to be addressed as a result of the current Consolidated Audit:

INSURANCE PACKAGE:

Recommendations:

M 1. Follow up with Loss Prevention to finalize the package of information for transmittal to the Corporate Loss Prevention Department for the insurance companies.

FIRED EQUIPMENT:

Recommendations:

M 1. The Burner Management documentation package should be organized to comply with L.P.P.-13.1 and guidelines from the Power Tech Center.

PROJECT REVIEWS:

Recommendations:

M 1. To comply with OSHA 1910.119 the project reviews and pre-startup reviews need to be documented and filed so that recommendations are trackable to completion.

CHEMICAL EXPOSURE INDEX:

The CEI calculation for chlorine resulted in value greater that 200, which will normally require further risk analysis reviews. This is to comply with a new Dow "Risk Management Guideline" that is currently being implemented. The source of chlorine in a pressure cylinder which is practically the same as several other users throughout the site and company. So, individual plant risk reviews are not being done.

Recommendations:

M 1. A separate CEI review summary has been written by Greg Nesmith to summarize the activities and procedures that were involved in the CEI review. Please file it with the Loss Prevention portion of the Consolidated Audit for future reference and documentation.

I appreciate the co-operation and am available as necessary for any follow up or future Loss Prevention activities.

HAZARDOUS MATERIALS TRANSPORTATION REVIEW (HMTR) AND DISTRIBUTION FACILITIES ASSESSMENT (DFA)

(April 8, 1994)

AUDIT TEAM: Dean Smith

PLANT CONTACT: Donald Yelverton

WRITER: Dean Smith

Comments and Recommendations:

On April 8, 1994 an HMTR/DFA was conducted and completed at the Power I/Utilities Plant as part of the Louisiana Division Consolidated Audit Program. Power I/Utilities Plant does not, as such, ship/transport, load/off-load or store hazardous materials for distribution. Hazardous materials such as chlorine and hydrogen are delivered and used at the facility and the cylinders returned as residue containers. These cylinders being returned have the potential for problem areas as recognized under the US DOT regulations. The Hydrogen tube trailers have recently been cleaned, tested and inspected and are in excellent shape.

Chemicals Reviewed	DRI #	TRANSPORTATION MODE: -All received by Hwy-	PRODUCT (P) FEED (FT)
Chlorine	4	Received in 150# cyl	T-Back-up for water treatment.
Chlorine	4	Received in 1 Ton cyl	T-Sewer treat.
Hydrogen	4	Received in "Tube" trailers	T-Power turbin

HMTR Questionnaire: All areas reviewed were satisfactory.

DFA: Only the Highway Mode was applicable for this part of the HMTR/DFA.

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Recommendations:

HR 1. Chlorine cylinders are received and picked up by the vendor, who, in this arrangement of service, have the main responsibility for the proper paperwork and DOT securement checks. However, because this material is classed as a Poison Gas / Inhalation Hazard, the facility must ensure proper marking and labeling is present while in use and prior to return shipment. A checklist and/or written procedure should be used to verify existing cylinders have the proper markings and labels and that those being received have the same. Two 150# chlorine cylinders were noticed to be in bad shape because of corrosion and/or out of date hydrostatic test. These were recommended to be replaced. All of the 1 Ton cylinders were in good order.

The Power I / Utilities Plant is in great shape thanks to the efforts of Marty Morrison. Keep up the good work. Thanks for the continued cooperation.

LABORATORY AUDIT

(June 6, 1994)

AUDIT TEAM: Howard Wilkinson

PLANT CONTACT: Marty Morrison

WRITER: Howard Wilkinson

Overall, the Power I laboratory is excellent shape. The lab inspection found the housekeeping to be in very good condition. Employees have access to all equipment operations manuals and procedures.

Very good job on labeling equipment and cabinets.

Recommendations:

None at this time.

SECURITY AUDIT SUMMARY
(January 4, 1994)

AUDIT TEAM: Al Lott

PLANT CONTACT: Marty Morrison

WRITER: Al Lott/Howard Wilkinson

All Dow employees are required to wear ID badges. Employees challenge strangers in their work areas. A sign-in/out log is available for visitors to the control room/plant area.

Emergency communications and alert systems are in place and working well. Security awareness seems to be working well at the Power I/Utilities Departments.

Keep up the good work.

Recommendations:

None at this time.

SAFETY AUDIT
(Monday, June 6, 1994; Wednesday, July 13, 1994)

AUDIT TEAM: Don Jones, Eddie Supple, Roddy Peebles, Howard Wilkinson

ATTENDING: Howard Wilkinson, Buck Bailey, Eddie Supple, Joe Rawlings, Ken Fox

PLANT CONTACT: Gervey Smith

WRITER: Don Jones, Eddie Supple

SAFETY QUESTIONNAIRE

A. Program Structure and Planning

See Documentation Review (Safety and Health Suggestions)

B. Employee Participation

No Recommendation

C. Contractor Safety

No Recommendation

D. Accident/Incident Investigation and Reporting

See Documentation Review (Accident/Incident Investigations)

E. Audits

See Documentation Review (Safety Equipment Inspections and Checks)

F. Safe Work Practices

M 1. Conduct annual performance audits of safe work permits, confined space entry and lockout/tagout. Also, identify deviations and track to completion.

G. Emergency Planning and Means of Egress

See Documentation Review (Unit Emergency Plans)

H. Employee Training

See Documentation Review (Unit Emergency Plans)

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I. Safe Operation of Motor Vehicles and Motorized Handling Equipment

No Recommendation

J. Off-The-Job Safety

No Recommendation

EMPLOYEE SURVEY

A new employee survey is being piloted at this plant. The results are still being evaluated and will be forwarded at a later date.

DOCUMENTATION REVIEW

A. Audits

No recommendations

B. Basic Safety

HR 1. Prepare and post safety policy.

C. Unit Emergency Plans

M 1. Update emergency plan.

M 2. After a drill is conducted the results must be critiqued and the critique documented. If any changes are identified they must also be documented such that the following are shown:
  * What was changed
  * Who made the change
  * When the change was made
  * How the change was communicated
  * Who communicated the change
  * Who communicated the change and to whom the change was communicated

D. Job Safety Analysis

M 1. Operating procedures should include name of person responsible for new or updated procedure instead of shift.

HR 2. Use a process (i.e. Power II Procedure Revision Form) other than MOC for updating procedures.

M 3. Deficiencies identified in pre-startup reviews must be documented and corrective actions tracked to completion. Documentation must show:
  * What corrective action was taken
  * Who completed the corrective action
  * When corrective action was completed

E. Accident/Incident Investigations

M 1. Update date due when extends beyond expected. Also, include explanation of why the original date due was missed.

F. Safety and Health Suggestions

M 1. Assure that all Unsafe Condition Reports are complete.

G. Safety Equipment Inspections & Checks

M 1. Perform checks on C-9 checklist and sign off on master on or before the due dates. Also complete all blanks including last date, scheduled date, etc.

M 2. C-9 file documentation (checklists, etc.) incomplete.

M 3. Deficiencies identified during the C-9 inspections must be documented and corrective actions tracked to completion. Documentation must show:
* What corrective action was
* Who completed corrective action
* When corrective action was completed

H. Hazard Identification Inspections

No recommendations

I. Predictive Preventive Maintenance

No recommendations

J. Variances

1. Update variances.

K. Contractors/Vendor/Visitor Orientation

M 1. Document pre-job meetings.

L. Safety and Operations Training

M 1. Document training of operators on the following:
* Steps for each operating phase including startup, normal operations, temporary operations, emergency shutdown, emergency operations, normal shutdown, and startup following a turnaround or emergency shutdown.
* Operating limits including consequences of deviations and steps required to avoid deviations.
* Safety and health considerations
* Safety systems and their functions

M. Safety Committee Activities

No recommendations

N. Safe Work Practices

No recommendations

FIELD INSPECTION #1

A. LOCKOUT/TAGOUT SYSTEM

* Red tag masters are located in the same office from which the SafeWork Permits are issued. There is one central location for all masters. Red Tag system/process seems neat and orderly.

* Audited 2 masters for accuracy and found all tags to be in place.

HR 1. Have old masters (1992 & 1993) still active. Although they have been routinely audited and updated, should complete needed work or consider permanent isolation or disabling of equipment in lieu of Red Tags.

M 2. The masters are not indicating when work crew rosters are NOT used. This practice has been discussed and it is felt that the use OR non use of the work crew roster should be indicated.

B. SAFE WORK PERMITS

No recommendations

C. CONTROL BOARD AREA

No recommendations

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D. OFFICE AREAS

M 1. OSHA and VPP postings present but need to be replaced with new ones, these are tattered.

E. LAB FACILITIES

See Lab Audit portion of Consolidated Audit

F. MOTOR CONTROL CENTERS

See Electrical portion of Consolidated Audit

G. MAINTENANCE SHOP and I & E areas

B-2804

1. Pedestal Grinder
M a. No face shield available

2. Pipe threading machine
* No recommendation

3. Drill Press
M a. No face shield available

4. Horizontal Band Saw
* No recommendation

5. Welding and Cutting area
M a. Use more shielding, only shielded on one side
M b. Modified C-clamps among tools in area

6. Other Equipment
* No recommendation

7. Hand held Power tools
* No recommendation

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8. Hand tools
    * No recommendation

9. Lifting tools

M a. At least one sling found in "annex" that had tape covering a large portion of the sling

b. Lifting jib and hoist rating not clearly marked

10. Safety Equipment
    * No recommendation

11. Housekeeping

HR a. Annex area of shop area used for storage, etc. is in need of housekeeping.

b. Compressed gas cylinders storage area holds water, some of the cylinders are standing in water

B-2808

1. Pedestal Grinder

M a. Top guards out of adjustment
M b. Tool rests out of adjustment
M c. Tool rests below center line of wheels
M d. No face shield available
M e. Soft material imbedded in left wheel
M f. Right wheel rounded off on inside edge
M g. No warning/required safety equipment signs in area

2. Pipe threading machine
    * No recommendation

3. Drill Press

M a. Face shield in garbage can next to drill press
HR b. Metal shavings and small amount of other trash on floor under and around drill press

4. Horizontal Band Saw

HR a. Minor housekeeping needed, metal shavings and small pieces of cut angle iron on floor under and around saw

5. Welding and Cutting area

M a. No welding shield available

6. Other Equipment

M a. Found an extension cord that had exposed wires that had been wrapped with vinyl tape

7. Hand Held Power Tools
    * No recommendation

8. Hand Tools
    * No recommendation

9. Lifting Tools
    * No recommendation

10. Safety Equipment
    * No recommendation

11. Housekeeping

HR a. Minor general housekeeping needed

HR b. Drill press and band saw areas

B-1802

1. Pedestal Grinder
    * No recommendation

2. Pipe Threading Machine
    * No recommendation

3. Drill Press
    * No recommendation

4. Horizontal band saw

HR a. Has an unconventional means of operation, should be so noted. Have to open valve to bleed press so that blade apparatus will lower once it has been raised

5. Welding Cutting Area

M a. No welding shield available

6. Other Equipment
   * No recommendation

7. Hand held Power Tools
   * No recommendation

8. Hand Tools
   * No recommendation

9. Lifting Tools
   * No recommendation

10. Safety Equipment

HR a. Body harnesses not neatly hung

M b. Rope wrist harnesses stored with body harnesses, one in particular had hooks with spring loaded safety latches that were not double locking, could have been mistaken for a lanyard (removed and destroyed this one)

11. Housekeeping

HR a. General housekeeping needed

HR b. Remove things stored on floor along walls and on beams on walls

H & I. WAREHOUSES/SPARE PARTS STORAGE

B-2804

M a. No load limit posted for upstairs storage

HR b. Grinders, drills, bandsaws, etc., stored in common bin and stacked precariously. Tried to remove one and a number of them began to fall.

M c. Removed one electrical hand tool that had the ground post missing from the plug

HR d. Could use general housekeeping

M e. Flex hoses that had no inspection/test tags

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M a. No load limit posted for upstairs storage
HR b. Badly in need of housekeeping/cleaning overall

J. MOTORIZED VEHICLES

No recommendation

FIELD INSPECTION TEAM #2

A. PROCESS AREA

* Guarding in good condition, utility stations labeled, special equipment/procedures/requirements are posted as needed. Housekeeping is in good condition.

HR 1. Noticed a few overhead leaks/drips, i.e. valve packing leak on a steam line above switch for Deluge Valve Station #4, 3 or 4 similar leaks in the area around switch for Deluge Valve Station # 5.

M 2. Not a lot of stenciling of lines in the process area. Other than road crossings there does not seem to be a lot of line contents identification.

B. EMERGENCY EQUIPMENT

* Safety showers visible and accessible, fire extinguishers in the areas and inspections area current. Respirators are carried on the person, none located in the areas.

M 1. 5 fire extinguishers with seals broken by Fire Extinguisher station #5.

C. PLANT HEALTH

* Found the plant to be in excellent condition. Painting and insulation good, ditch grating in good shape, no obvious corrosion. Tremendous improvement over 1992 audit.

D. ENCLOSURES

No recommendations

E. ACCESS SYSTEMS

* Portable ladders are in good condition, also noticed that as a rule they are stored in designated areas and not left out in the areas where they were last used. The fixed ladders are also in good shape and have either swing gates or chains at the elevated entry/exit points.

HR 1. Noticed some swing gates/chains left in the open/down position on some of the ladders. Remind folks that these are to be left/returned to their intended position (closed/up) after use.

F. OBSERVING PEOPLE WORKING IN AREA

* Observed FD 2A work. Proper tools, in good condition, permit on site and in good order.

* Observed two insulators. One was on the ground and one was in the pipe rack sitting on a pipe working. The one in the rack was wearing and using properly the required safety equipment. The one on the ground was going to attempt to throw the Safe Work Permit up to the one in the rack but the one in the rack told him to put it on his buggy on the ground. Stopped the one on the ground and pointed out to him the dangers associated with throwing things from one level to another. He agreed.

* Observed two folks working on an air conditioner for the control room building. One was using a pipe wrench to hammer on a bolt trying to drive out another bolt, intervened and asked that the proper tools be used. The other worker was not wearing ear protection, intervened and reminded him to wear ear protection as required.

G. ELECTRICAL

* Start/stop stations, breakers, etc. properly labeled. No loose, exposed wires observed.

M 1. Noticed that the door was in the open position on electrical panel L-17 for no apparent reason. All panels/etc. should be covered or closed as applicable.

H. OVERHEAD HOISTS

No recommendations

I. HOUSEKEEPING

* Process areas are in excellent condition

HR 1. Some housekeeping needed as mentioned in other sections

HR 2. B-2811 (storage building SW of B-2804) has hoses piled up on and covering most of the floor area. One would have to step on hoses to reach materials stored on shelves or in bins.

J. BLOCK ENTRANCES

No recommendations

GENERAL:

HR 1. Drip leg traps/drains by inst. air compressor #5 discharge above the intended drain. These should be routed into the drain.

HR 2. There is a cable running under the top deck of the structure on the far west of the process (directly west of the control room) that should be removed if possible

M 3. Found one harness that had gray tape on it to hold the ends of the straps in place. The practice of taping harnesses is not allowed because tape can hide problems.

M 4. Found an extension cord that had been taped up.

M 5. LOC (on ground just west of stairway on SW corner of the control room deck) has no railing on the top.

M 6. Scaffold on west side of the roadway in the middle of the plant had a ladder that did not extend above the handrail and there was no apparent reason that it couldn't.

EMPLOYEE/CONTRACTOR INTERVIEWS

No employee/contractor interviews where conducted by the Major Manager.

REACTIVE CHEMICALS AUDIT

(Thursday, June 2, 1994)

AUDIT TEAM:	Joe Schell, Gerald Wagener
PLANT CONTACT:	Marty Morrison
ATTENDANCE:	Roger Hudston, Ken Fox, Joe Rawlings, Howard Wilkinson, Eddie Supple
WRITER:	Gerald Wagener

The pre-audit review was conducted on Thursday, June 2, 1994. Roger Hudson was recently appointed plant superintendent at Power I/Utilities. Roger reviewed the first and second Consolidated Audit Reports, documentation and participated in this Reactive Chemicals Review. It was decided by the audit team and plant supervision that this review would take the place of the new superintendent Reactive Chemical Review requirement.

Recommendations:

M 1. Scenario: Catastrophic corrosion of boiler during cleaning due to inadvertent use of wrong or non-inhibited acid.

Develop acceptance criteria for the inhibited acid which is used for boiler cleaning and verify by performing positive ID testing.

M 2. Scenario: High or steadily increasing oxygen concentration in off gas from LHC 2 & 3.

Determine if this is a credible scenario and, if so, make sure appropriate lines of defense are in place to avoid a flammability problem.

PROCESS CONTROL NETWORK AUDIT

(June 10, 1994)

AUDIT TEAM: Mike Woods

PLANT CONTACT: Marty Morrison

WRITER: Mike Woods

Recommendations:

M 1. Install a RUSCO card reader on the EMC building to secure MODICON access.

M 2. Remove memory keys from MODICON. The board person will assume ownership of the access to the MODICONs.

M 3. Establish a written procedure for the backup of the SPECTRUM/SPEC 200.