Purpose and Scope

The policy of the Verso is to maintain compliance with federal and State regulations pertaining to the use of radioactive material devices in our organization. The guidelines in this manual are to assist all employees' to comply with pertinent regulations and license conditions specific to each type of radioactive material use.

In addition, the Verso has adopted the operation Philosophy for Maintaining Occupational Radiation Exposures As Low As Reasonably Achievable (ALARA) as outlined in NRC Regulatory Guides.

Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Reasonably Achievable

A. Introduction

10 CFR, part 20 states that licensees should make every reasonable effort to maintain radiation exposures as far below the limits as practicable.

B. Discussion

The objective is to reduce occupational exposures (ALARA) by means of good radiation protection planning and practice, as well as by management commitment to policies that foster vigilance against departures from good practice. In addition, the sum of the doses received by all exposed individuals should be maintained at the lowest practical level.

C. Regulatory Position – Two Basic Conditions:

1. Management Commitment

   Clearly defined radiation protection responsibilities and environment in which radiation protection staff can do its job properly.

a) Plant personnel should be made aware of management's commitment to keep occupational exposures As Low As Reasonably Achievable. This commitment should appear in policy and statements, instruction to personnel, and similar documents. All workers should be sufficiently familiar with this commitment and should be able to explain what management commitment is, what ALARA is, why it is recommended, and how they had been advised to implement it on their jobs.

b) Management should periodically perform a formal audit to determine how exposures might be lowered. This should include reviews of operating procedures, past exposure records, plant inspections, and consultation with radiation protection staff or outside consultants. Management should also be able to determine in which locations most exposures are being received, and what groups of workers are receiving the highest exposures.

c) Management should ensure that there is a well-supervised radiation protection capability with well-defined responsibilities – Radiation Safety Officer.

d) Management should see that plant workers receive sufficient training. Training should be sufficient to ensure that the workers can correctly answer questions on radiation protection as it relates to their jobs.

e) The Radiation Safety Officer should be given sufficient authority to enforce safe plant operation. The Radiation Safety Officer should be able to prevent unsafe practices and communicate with management about halting an operation he/she deems unsafe.

f) Modifications to operating and maintenance and to plant equipment in the facilities should be made where they will substantially reduce exposures at a reasonable cost.

2. Vigilance by the Radiation Safety Officer and the Radiation Protection Staff

a) The Radiation Safety Officer and the Radiation Protection Staff should know the origins of radiation exposures in the plant. This analysis should be done by location, operation, and job category. There should be an awareness of trends of exposures.

b) The Radiation Safety Officer and the Radiation Protection Staff should look for ways to reduce exposures. When there is an unusual exposure, an investigation should take place to determine the cause and there should be steps taken to reduce the likelihood of similar future occurrences. Radiation Safety Officer and Protection Staff should also periodically review operating procedures to identify situations in which exposures can be reduced.

c) Adequate equipment and supplies for radiation protection work should be provided. Written procedures for the use of the equipment should be available and followed.

Procedure for Maintaining Occupational Radiation Exposures "As Low As Reasonably Achievable"

Policy:

The purpose of this procedure is to ensure that the occupational radiation exposures to personnel at Verso facility in Escanaba, Michigan are kept ALARA. Through training, good radiation safety work practices, procedures, and reviews by the Radiation Safety Officer or designee exposures to radiation can be kept ALARA.

Procedure:

Based on calculations submitted with our NRC radioactive material license application no personnel monitoring for radiation exposure from the nuclear gauging devices is required. These calculations are based in a worst-case scenario for operators and/or individuals working directly with the devices.

1. No additional personnel monitoring devices need to be utilized due to the presence of these gauging devices. The source holders are designed so that radiation levels will be less than 5 mR/hr at one foot from any accessible surface with the device in the off position. With the shutter open, a collimated beam of radiation exists between the source head and detector traversing the vessel being monitored.

2. As indicated above, the dose to the operators within this facility are below the 100 mREM limit allowed to the general public. Additional steps are taken to ensure compliance with these requirements. All employees receive general awareness training, all visitors must watch the orientation training and take a written test (all visitors must be escorted by mill personnel), and each gauge is clearly labeled with a radiation warning sign. A secured storage area is available for gauges that are not mounted. This area is posted with a warning and the exposure rate at the closest accessible point is less than 2 mREM in any one hour. Only the RSO or his designee has access to this area.

Ordering and Receiving of Radioactive Material

Policy:

This procedure is to ensure all radioactive material received by the Verso is properly secured and surveyed.

Procedure:

A. Only the Radiation Safety Officer or his/her designee may order radioactive material.

B. Upon receiving a package of radioactive material, the Radiation Safety Officer or designee shall be notified.

C. The Radiation Safety Officer or designee will check the packing slip and contents to make sure the contents and packing slip agree with what was ordered.

D. The package shall be checked for damage. If damaged, the Radiation Safety Officer will isolate and survey the package, delivery truck and delivery personnel to ensure no leakage or contamination has occurred. (These are gauges, so the likelihood of damage is little). The Radiation Safety Officer will contact the manufacturer and appropriate authorities, if contamination is found.

E. The Radiation Safety Officer will log in the gauge and file the manufacturer's documents and packing slip in the appropriate file.

F. The Escanaba Mill utilizes small nuclear gauges under license attained from the federal Nuclear Regulatory Commission (NRC). The mill operates under a written Radiation Safety Program maintained by the Electrical Department. As a part of this program, the following guidelines have been developed to instruct contractors, vendors, service rep.'s, or any other non-mill personnel in the minimum requirements to bring nuclear sources on the Mill site.

I. Escanaba Mill Project Managers (PM) who contract with non-mill personnel to bring nuclear gauges or other equipment on the Escanaba Mill site have the responsibility to contact the Escanaba Department. Prior to non-mill personnel bringing nuclear equipment on site, the PM needs to confirm that Electrical department has a copy of the license that the gauge will be used under. The PM is responsible to acquire and forward a copy of the license to Safety department if it is not already on file at the mill.

Semi-Annual Physical Inventory

Policy:

The purpose of this procedure is to ensure that the Verso maintains control of all radioactive material and maintains compliance with its NRC radioactive material license.

Procedure:

A. A physical inventory shall be conducted on a six-month frequency to account for all nuclear devices received and possessed under the license.

B. This inventory shall be maintained on an inventory sheet or similar document. The information maintained on this document shall include, but not be limited to, the following:

1. Quantity of radioactive material contained in each device. (Activity)
2. Kinds of radioactive material contained in each device. (Isotope)
3. Manufacturer's Name, Model number and Serial number.
4. Location of each device.
5. Completion date of each inventory.
6. Name of the individual(s) completing the inventory.

C. The following items must be checked for each nuclear Gauge during the performance of the inventory.

1. Physical condition (solid mounting of source)

   That the required Radioactive Material and Radiation Cautions signs are posted

2. Signs on **ALL** access covers to vessels stating:
   Caution Radiation - Gauge shutter must be locked in closed position before entering vessel

3. The documentation of the inventory must be maintained for a period of three (3) years.

Leak Testing of Nuclear Gauges

Policy:

This procedure is to ensure that the sealed sources in the Verso nuclear devices are not leaking radioactive material and to maintain compliance with the NRC radioactive material license.

Procedure:

A. Each nuclear device containing more than 100 microcuries of beta and/or gamma emitting material, or more than 10 microcuries of alpha emitting material, shall be tested for leakage and/or contamination at intervals not to exceed the frequency indicated by the manufacture. (3 months, 6 months or 3 years)

B. The Radiation Safety Officer or his/her designee will perform the leak testing of all nuclear devices requiring this test.

C. Leak test kits will be obtained from the manufacturer or other firm licensed to perform these tests (e.g. Stan A. Huber Consultants, Inc., New Lenox, Illinois).

D. The leak testing shall be completed following the instructions of the leak test kit supplier. Areas to be wiped should include those areas where you may expect contamination to be found (e.g. shutter window, source housing welds or seams, etc.) Please note: the shutter should be closed prior to wiping the window.

E. The leak test kit must be returned to the supplier for analysis. When processed, certificate will be received from the supplier with the results of the analysis. If leakage and/or contamination is 0.005 microcuries or more, the device must be taken out of service, immediately. Contact the manufacturer or other licensed firm for repair or disposal.

Please note: A report must be filed with the NRC within 5 days of the date the leak test results is known to have exceeded the limit.

F. If leak test results indicate leakage and/or contamination levels to be acceptable, the Radiation Safety Officer shall review and sign the certificate and have the certificate filed. Please note: Before transfer of any nuclear gauges a leak test must be performed within the previous six months.

G. Upon the completion of the leak test, the date completed and the next date due should be updated on the file.

H. A copy of the leak test certificate for each device shall be maintained on file.

Disposal and/or Return to Manufacturer of Radioactive Material

Policy:

This procedure is to ensure all radioactive material in the possession of the Verso is properly disposed or returned to the manufacturer for disposal.

Procedure:

A. Arrangements for disposal of a gauge or return to the manufacturer for disposal shall only be made by the Radiation Safety Officer or his/her designee.

B. If contracting a disposal firm, remember to check their radioactive material license to ensure they are licensed to receive the gauge. Please note: A leak test of each gauge must be performed within the previous six (6) months prior to transfer. A copy of the leak test certificate shall be provided to the manufacturer or other firm taking possession.

C. When transfer is made to the disposal firm or manufacturer, have them supply a record of receipt or manifest of disposal for Verso records.

D. Maintain a copy of the shipping records for each gauge, along with the record of receipt or manifest or disposal for each gauge. These records must be maintained until the NRC gives approval for the disposal of the records.

Radiation Safety Training

Policy:

Verso requires initial training and annual training in radiation safety to ensure that the ALARA concept is met.

Procedure:

A. Initial and annual radiation hazard awareness training shall be provided to all production workers. This training is given during the plant orientation process. The training consists of reviewing the lock out/tag out procedures and recognition of the radiation warning signs.

B. Initial and annual radiation safety training shall be provided to all E&I maintenance personnel in the safe handling, installation (removal and relocation), operation, and maintenance of nuclear gauges.

1. This training will be provided by having these personnel review the basic radiation safety video or completing the summit computer based training program or by participating in a training session given by the RSO or designated personnel.

2. The records of this training shall be maintained. As a minimum the record shall include:

    a. The name of the individual(s) receiving the training.

    b. Date completed.

    c. Topics covered, title of videotape and/or documents reviewed.

    d. Identification of the individual presenting the training if applicable.

Calibration of Radiation Detection Instruments

Policy:

This procedure is to ensure Verso survey meters are properly calibrated, so accurate data can be obtained from the radiation exposure rate surveys.

Procedure:

A. All radiation detection instruments (survey meters) shall be calibrated at intervals not to exceed 12 months.

B. The calibration shall be performed by a firm license by the NRC and/or Agreement State to provide calibration services. (Example: Stan A. Huber Consultants, Inc., New Lenox, Illinois) Please Note: A copy of the firm's radioactive material license shall be maintained on file.

C. Records of all calibrations shall be maintained for a minimum of two (2) years after each calibration.

D. Prior to each day of use the survey meter shall be checked for proper functioning using a dedicated check source. The reading each day shall be within +/- 20% of the reading

obtained at the time of the annual calibration. If the reading is outside of the +/- 20% variance, the survey meter shall be taken out of service and re-calibrated or repaired.

Procedure for Nuclear Gauge Installation, Removal, Relocation

Policy:

This policy is to ensure ALARA is met, while working with the nuclear gauges. This procedure shall be followed by all individuals authorized to install, remove or relocate nuclear gauges.

Procedure:

A. Those individuals listed on the radioactive material license must be present for the installation, removal, relocation, and initial radiation survey of nuclear gauges. E&I maintenance personnel are authorized to perform these functions under the direct supervision of the licensed authorized users or specific licensed company.

B. No installation, removal, or relocation shall be performed without notifying the RSO.

C. Non-routine maintenance shall only be performed by the licensed manufacturer or a licensed service provider. Non-routine maintenance or repair (beyond routine cleaning, lubrication, calibration, and electronics repairs) means any maintenance or repair that involves or potentially affects components, including electronics, related to the radiological safety of the gauge (e.g., the source, source holder, source drive mechanism, shutter, shutter control or shielding) and any other activities during which personnel could receive radiation doses exceeding NRC limits.

D. Installation Procedure

The following steps shall be followed when installing a nuclear gauge:

1. Shutter operator handles shall be locked in the closed position until the housing is bolted in its final operating position. (Indicate the shutter closed on the gauge survey form)

2. Individuals installing gauges shall limit the time spent by themselves and others in handling source housings to an absolute minimum.

3. After installation, a confirmatory leak test shall be performed on the source housing. This test does not restrict the operation of the device pending the results. Check the

appropriate box on the survey form to indicate completion. (Leak test kits can be obtained by contacting the RSO.)

4. The source housing shutter mechanism shall be checked for proper operation. The labels attached to the housing shall be checked for accuracy. Check the appropriate boxes on the survey form to indicate completion.

5. An authorized user shall perform a radiation survey of the source housing, detector, and adjacent areas. The surveys shall be performed with the source-housing shutter in the open or "measure" position. Record the survey results on the survey form.

   a. If any dose rate in excess of 5.0 mR/hr is found at a distance of 12 or more inches from any surface of the source housing or detector, adjustments shall be made to lower the dose rate to an acceptable level.

   b. If the dose rate cannot be reduced to an acceptable level the authorized user shall ensure that a "Caution Radiation Area" sign is posted and/or barricades are installed.

6. Other precautions that shall be implemented are:

   a. The air gap between the gauge and pipe or vessel would not allow insertion of a 30 cm (12 inches) diameter sphere into the radiation beam of the gauge without removal of a barrier.

   b. Post signs on vessel entry doors near the gauge to warn individuals that lockout; tag-out procedures must be used to enter the vessel.

7. Complete the gauge radiation survey form and provide a copy of the RSO. Please note: Indicate whether or not this was an installation or removal of a gauge by circling one or the other at the very top of the page.

E. Relocation Procedures

The following steps shall be followed when relocating a nuclear gauge:

1. The RSO shall be notified that the gauge is to be relocated for his/her approval.

2. The shutter operator handle shall be locked in the closed position before the housing or detector is unbolted. Record the shutter position on the survey form.

3. When re-installing the nuclear gauge follow the procedure for installation.

4. Complete the survey form and provide a copy to the RSO.

F. Removal Procedures

The following steps shall be followed when removing a nuclear gauge from service:

1. The RSO shall be notified that the gauge is to be removed and stored for his/her approval.

2. The shutter operator handle shall be locked in the closed position before the housing or detector is unbolted.

3. If the housing is to be placed in storage, a radiation survey of the storage area shall be performed to assure that persons working in the vicinity will not be exposed to excessive levels of radiation. Record the results on the survey form.

4. If the housing is to be returned to the manufacturer for repair or disposal, contact the manufacturer for proper shipping information. Perform a leak test, if one has not been completed within the previous six (6) months.

5. If permanent removal, check / remove any unnecessary warning signs.

6. Complete the radiation survey form and provide a copy to the RSO.

Security of Radioactive Material

Policy:

The policy of Verso is to ensure that all radioactive material possessed under the NRC radioactive material license or a manufacturer's general license is secured from unauthorized access or removal.

Procedure:

A. Other than portable nuclear gauges or tabletop gauges, all nuclear gauges shall be mounted unless in storage area. The RSO or his/her designee shall control the storage area key.

B. The RSO will be notified prior to any radioactive sources being brought onto the plant site.

C. No nuclear gauges shall be ordered or removed from the plant without notifying the RSO for approval.

D. No nuclear gauges shall be removed from its mounted position or relocated without notifying the RSO for approval.

E. The RSO, authorized users listed on the radioactive material license and E&I maintenance personnel shall have control of the keys for unlocking the gauge shutter levers.

Emergency Procedures for Events Involving Radioactive Material Gauges

Policy:

Verso has adopted this procedure to ensure the safety of all employees and the public in the event of an accident involving radioactive material gauges. The procedure is to ensure prompt reporting of all radiological incidents.

Procedure:

If fire, explosion or mechanical damage to any device containing radioactive material is found or suspected, use the following procedure:

1. Cease work immediately. (Follow Verso policy for initial response to fire, explosion and other emergency conditions.)

2. Rope off the area around the source holder to a radius of 10 feet or more. Survey area and move roped area to restrict area to 2mR/hr.

3. Immediately notify these personnel in the order listed.

Emergency Contact list

A. Carl Lippens,Radiation Safety Officer
(906)233-2526

B. Jeff Thennes, Assistant Radiation Safety Officer
(906)233-2896

C. The Health Physics Consultants:
Stan A. Huber Consultants, Inc.
200 North Cedar Road
New Lenox, Illinois 60451
(815) 485-6161

D. Gauge Manufacturer

The Radiation Safety Officer will notify the Nuclear Regulatory Commission, if the incident is a reportable event

U.S. NRC Region III
2443 Warrenville Road, Ste 210
Lisle, Illinois 60532-4352
(630) 829-9887

Posting and Labels

Policy:

All required postings and labels on gauges will be maintained by Verso to warn individuals of the presence of radioactive material and their right to know.

Procedure:

A. The following documents shall be posted:

1. NRC "Notice to Employees",
2. Michigan Department of Public Health "Notice to Employees",
3. "Notice, Instructions and Reports to Workers; Inspections" document which identifies where important documents can be reviewed;
4. "Caution – Radioactive Material" signs on gauges; and
5. Emergency contact number of the Radiation Safety Officer.

B. All manufacturers labels shall be maintained on the gauges. If the labels deteriorate, they must be replaced immediately.

Annual Review of the Radiation Safety Program

Policy:

This procedure is to ensure that Verso maintains compliance with the NRC regulations and the NRC radioactive material license requirements.

Procedure:

A. Annually the Radiation Safety Officer shall perform a review of the Radiation Safety Program.

B. This review shall include all requirements noted in this Policy and Procedure manual and any additional requirements that may be incorporated into out license.

C. The RSO will document any deviations noted during this review and implement corrective actions.

D. The Radiation Safety Officer shall document the results of all records reviewed and corrective actions taken to avoid recurrence.

E. If specific items of non-compliance are recurring, the Radiation Safety Officer may elect to perform reviews that are more frequent and administer actions that are more stringent.