STANDARD OPERATING PROCEDURES

PROGRAM APPLICABILITY: 2603

88058-01 INSPECTION OBJECTIVES

01.01   To determine whether the licensee has in place an adequate program for the development and on-going maintenance of clearly written Standard Operating Procedures (SOPs) that ensure that operations are carried out safely, consistently and efficiently.

01.02   To verify that the SOPs are up-to-date and reflect current plant practices and conditions.

01.03   To verify that the SOPs are checked by technically competent personnel for content and approved by management.

01.04   To verify that the SOPs are sufficiently detailed to be effective and useful, but not too detailed to discourage use.

01.05   To verify that the SOPs can be used in the working environment for which they are intended, and that they can be easily understood.

01.06   To verify that all new and updated SOPs have had an independent review and are approved by management before being authorized for use.

01.07   To confirm that all SOPs are reviewed on an annual basis.

01.08   To determine whether the pertinent Process Safety Information (PSI) elements are properly integrated with the SOPs.

01.09   To determine whether pertinent elements of the training program are properly integrated with the SOPs.

01.10   To determine whether recommendations from the Nuclear Chemical Process Safety Program (NCPSP) inspection elements (such as Hazard Identification and Assessment (HIA), Incident Investigation and Audits) concerning SOPs are properly incorporated in the procedures.

01.11 To verify that NRC license commitments are identified in SOPs.

88058-02 INSPECTION REQUIREMENTS

02.01   Review the licensee's SOPs to ensure that all applicable processes have been described.

02.02   Review the licensee's SOP development program to ensure that the personnel used to develop the SOPs are properly qualified in plant operations and process technology. The inspector should interview some of the persons involved in developing and maintaining SOPs to verify that they are competent and are knowledgeable in processes and procedure writing.

02.03   Verify that all new and updated SOPs are reviewed and updated by persons who are independent of the team that wrote the procedures. Written documentation of the review process (i.e., quality assurance for SOPs) should be available for the inspector to examine.

02.04   Review the information in a few of the SOPs being used at the facility to ensure that they use pertinent PSI elements. The inspector should make sure that SOPs are consistent with the known hazards identified in the PSI and that specified operating parameters lie within the safe operating envelope identified in the PSI.

02.05   Review the mechanism for ensuring that all operators are trained in the use of SOPs. Also, ensure that they are trained in a timely manner when updates or revisions are issued. Written documentation of the training process is required.

02.06   Review the licensee's SOPs to ensure that they adequately address each of the following phases of the operation:

  a. Initial Startup
  b. Startup after a shutdown
  c. Startup after modification
  d. Normal Operations
  e. Shutdown
  f. Emergency Shutdown
  g. Emergency Operations
  h. Temporary Operations
  i. Alarm Response
  j. Safety Systems - interlocks and their functions

02.07   Review the licensee's SOPs to ensure that a clear distinction has been made between each of the following activities:

  a. Emergency Operations
  b. Emergency Shutdown
  c. Emergency Response
  d. Troubleshooting

02.08   Review the licensee's SOPs to ensure that they are clear and usable, and that they are readily accessible at all times to workers. In addition, the inspector should check that the SOPs are actually being used. The inspector should interview some field operators to verify that this is the case.

88058-03 INSPECTION GUIDANCE

General Guidance

The inspection should assess the accuracy, currency, and usability
of the SOPs. There should be clear, written evidence that the
operators have been trained in the use of the SOPs and that they
are being used on a regular basis.

Specific Guidance

03.01

  a. All SOPs, temporary procedures, or special instructions,
      etc., must be documented. Ensure that verbal communications
      are never relied on.

  b. If the written procedures or changes are stored
      electronically in the plant's Distributive Control System (or
      other electronic system), ensure that hard copies of the
      procedures are available in case of a total system failure.
      When interviewing operators, ask if they know where hard
      copies of procedures are located.

03.02

  a. The personnel responsible for developing the SOPs must be
      fully qualified. The operations expert(s) must be able to
      demonstrate in-depth knowledge of how the process operates in
      all phases of the operation, particularly startup, shutdown,
      and emergencies. The technical information used in the
      procedure, such as the safe upper and lower operating limits,
      should be supplied or verified by a qualified process
      engineer or other technical expert.

  b. In the case of new plants, which have not yet been
      commissioned, the team writing the SOPs must show that they
      have in-depth expertise in the operation of plants of a
      similar type of technology.

  c. The end users of the SOPs, the plant operators, should be
      fully involved in the writing process and in the reviews. As
      a minimum, plant operators should conduct walkdowns using
      SOPs. This will ensure that the final product addresses
      their needs.

  d. Human factors should be adequately addressed during the
      development of SOPs, to ensure safe working conditions. Both
      the operator-process interface and the operator-equipment
      interface should be adequately addressed.

03.03

a.   All SOPs must be reviewed by an independent review team. The review team should check for internal consistency within the SOPs. For existing plants, the reviewer should also field-check the procedure to ensure that it is accurate and usable.

b.   Verify that SOPs are not issued until they have been properly reviewed and authorized. In particular, ensure that draft SOPs are not issued unofficially.   All SOPs should be approved by management.

c.   Verify that all graphics materials, such as photographs, drawings, and sketches, are updated along with the text materials.

d.   Verify that the licensee's review team includes personnel qualified to evaluate the SOPs for safety and health issues. Human factors should be adequately addressed in the development of SOPs. Human factors should be evaluated as part of task analyses performed before the development of SOPs, to ensure safe working conditions for operators.

03.04   The integration of SOPs with other elements of the NCPSP is part of the overall "Management of Change" process. The PSI elements that have a particularly strong connection with SOPs are:

a.   Safe Upper and Lower Operating Limits for key variables, such as flow, temperature, pressure, concentration, and composition. The response to a deviation in any of these should be defined.

b.   Changes in the process chemicals, technology, equipment (including computer process control programs), or facilities.

03.05

a.   Ensure that a list of all workers, including contract workers, who may need to use the procedures, is available, and that this list is used to schedule training on SOPs.

b.   Ensure that all employees and contract workers who are operating the unit for which SOPs have been written have been properly trained in the application of the procedures and that they have been properly and promptly trained in updates and changes that are made to them.

03.06

a.   In some cases, certain sections of the SOPs might not be necessary (e.g., Initial Startup Procedures for a plant that is already in operation). Some of the other sections (e.g., startup after shutdown) might have to address specific situations such as startup after an extended shutdown (like a plant closure) or after a maintenance shutdown.

b.   Many batch plants use supplemental operating instructions for each batch of product; these are often referred to as "Batch Sheets." In some cases, the only source of procedures is the

batch sheet. The inspection requirements described in this document for SOPs also applies to "Batch Sheets" and related documents.

   c.   The SOPs should clearly define the interface with other workers, such as maintenance and truck movements. The SOPs must clearly define who is responsible for which activities.

   d.   Temporary operating instructions, log sheets, checklists, and sampling procedures are subject to all the inspection requirements described in this document. SOPs available to operators on computerized systems (such as the Distributed Control System) should also be subject to these same inspection requirements. Hard copies of all SOPs on the computerized system should be readily available for review, and the review process should be the same as for SOPs issued as hard copies.

03.07

   a.   The emergency section of the SOPs should distinguish between emergency operations and emergency shutdown. A shutdown is not always the best response to an emergency situation, and the procedures should provide guidance on this.

   b.   Conditions that require an emergency shutdown must be clearly defined and understood.

   c.   The assignment of responsibility during an emergency operation or shutdown should be clearly defined.

   d.   For those facilities that are controlled by Distributed Control Systems or computer process control systems and/or that have automated emergency shutdown systems and interlocks, the logic of these systems that operate during an emergency should be described and explained in the SOPs.

   e.   Emergency SOPs are written for the operators running the unit for which they are responsible. The Emergency Response Plan is generally initiated when the emergency spreads beyond the borders of that plant, and when outside assistance is required. The SOPs must clearly distinguish between the two. In particular, it must be made clear who is in charge of the facility at the various stages of an emergency.

   f.   A Troubleshooting Guide and/or Alarm Response Procedures provides operators with assistance in the recognition and correction of process deviations by including information on consequences of deviations from safe operating limits, and possible actions that can be taken to return the system to its normal mode of operation.

   g.   The Troubleshooting Guide and/or Alarm Response Procedures does not have to be a separate document. It can be integrated within the SOPs.

03.08   The SOPs must always be usable and accessible. Check for the following.

   a. The written text must always be readable in all working conditions (e.g., at night, and if computer-based, monitors must be located near work areas).

   b. The binders must not be too bulky.

88058-04 RESOURCE ESTIMATE

An inspection performed using this inspection procedure is estimated to require 8 hours of inspector resources. This estimate is only for the direct inspection effort and does not include preparation for and documentation of the inspection.

88058-05 REFERENCE

OSHA, *Process Safety Management of Highly Hazardous Chemicals*, 29 CFR 1910.119(f), "Operating Procedures."

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