NUMBER: C.2
DATE: 8/89

Activity: **Chemistry - Control of Reagents and Solutions**

1.0 Purpose: To provide guidance for evaluating the chemistry and radiochemistry laboratories' reagent chemicals and solutions.

2.0 Scope: The information provided by this guideline is applicable to the site chemistry and radiochemistry laboratories established at nuclear power plants. Guidance is provided for surveying the implementation of controls over laboratory reagent chemicals and standard solutions used for measuring the chemical and radioactive parameters and contaminants associated with the various plant effluent and process streams.

3.0 References:

3.1 Regulatory Guide 4.15, 1977, "Quality Assurance for Radiological Monitoring Programs Effluent Streams and Environment"

3.2 NRC Inspection Module 83722, "Radiation Protection, Plant Chemistry and Radwaste: Organization and Management Controls"

3.3 INPO Good Practice CY-702, "Verification of Analytical Performance"

4.0 Guidelines:

4.1 In preparation for and during the conduct of this surveillance:

- Obtain and review implementing procedures, instructions and drawings governing this activity.
- Prepare a guide or checklist using the selected items from this guideline.
- Review past surveys, audits, surveillances and other evaluations/ assessments.
- Ensure that checklists include, where applicable, actual observations of performance, general plant conditions, radiological work practices, housekeeping, work document controls and use, and safety practices.

NOTE: Refer to Guideline A.1, "General Quality Surveillance Guidance," for specific details on the attributes listed above.

4.2 For a representative sampling of reagent chemicals, request the laboratory representative to present them and, if not in immediate use, note their storage condition.

A. Verify the names and/or chemical formulae of the reagents conform to the requirements of the analytical procedure. Verify the reagent's grade of purity conforms to the requirements. If an analytical procedure stipulates a specific choice(s) of manufacturer for certain reagents, verify the surveyed items conform.

B. By examination verify each reagent bears the tag required to have been placed by the Power Stores personnel and that each tag identifies the item's expiration date. Confirm all surveyed reagents are within their shelf life.

C. Determine the storage requirements of the surveyed reagents maintained by the site laboratory and verify the observed storage conditions are within compliance.

D. Witness the mixing of laboratory solutions and verify they are labeled with the following minimum information: identity of the solution (by name or chemical formula), its concentration, the identity of the preparer, the date of preparation, and, if the solution has a shelf life of less than one year, the solution's expiration date. Verify none of the site-prepared solutions available in the laboratory have been kept beyond their expiration date.

E. If any of the solutions impose special storage condition restrictions, for example, light, heat, vibration, or bacteria, verify by observation the required restrictions are in place.

4.3 Survey the storage conditions of stocked laboratory chemicals and for a representative number of items verify the availability of written storage instructions, including guidance on maximum shelf life. When performing the quality surveillance, the following issues may be of interest:

A. By examination verify the stored laboratory chemicals have been tagged with the expiration date noted.

B. Verify the storage instructions.

C. Verify by record review that those vendor certifications required by the applicable plant procedures and purchase orders, as well as receiving records, are available.

D. If either segregation within the storage area or special safety precautions are

required for certain reagents, observe whether compliance is achieved.

E. Verify a frequency of inventory taking is established, if required, and confirm by record review that is has been implemented.

F. Verify there are no reagents within the scope with tagged expiration dates preceding the previous inventory taking date, if an inventory date is required.

G. Verify reagents that have expired shelf life are properly segregated.

4.4 For a representative sampling of chemical solutions, request the laboratory representative to present them and, if not in immediate use, note their storage conditions.

A. Determine whether any of the surveyed standard solutions require special storage conditions and, if so, verify they are met. If shelf life is restricted for any of these standards, verify it is observed.

B. Determine whether the standard solutions are properly identified and if NBS traceability is required that a system has been established to achieve traceability.

5.0 Other Guidelines for Consideration:

5.1 A.1, "General Quality Surveillance Guidance"

5.2 B.1, "Calibration of Chemistry Instrumentation - Process and Laboratory Analysis"

5.3 C.1, "Chemistry Laboratory Practices"