TVA EMPLOYEE CONCERNS
SPECIAL PROGRAM

REPORT NUMBER: 91200

REPORT TYPE: Watts Bar Nuclear Plant Subcategory

REVISION NUMBER: 2

TITLE: Industrial Hygiene Practice as Related to Industrial Safety

PAGE 1 OF 55

REASON FOR REVISION:

To incorporate two additional concerns and to revise section 5.

PREPARATION

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Preface

This subcategory report is one of a series of reports prepared for the Employee Concerns Special Program (ECSP) of the Tennessee Valley Authority (TVA). The ECSP and the organization which carried out the program, the Employee Concerns Task Group (ECTG), were established by TVA's Manager of Nuclear Power to evaluate and report on those Office of Nuclear Power (ONP) employee concerns filed before February 1, 1986. Concerns filed after that date are handled by the ongoing ONP Employee Concerns Program (ECP).

The ECSP addressed over 5800 employee concerns. Each of the concerns was a formal, written description of a circumstance or circumstances that an employee thought was unsafe, unjust, inefficient, or inappropriate. The mission of the Employee Concerns Special Program was to thoroughly investigate all issues presented in the concerns and to report the results of those investigations in a form accessible to ONP employees, the NRC, and the general public. The results of these investigations are communicated by four levels of ECSP reports: element, subcategory, category, and final.

Element reports, the lowest reporting level, will be published only for those concerns directly affecting the restart of Sequoyah Nuclear Plant's reactor unit 2. An element consists of one or more closely related issues. An issue is a potential problem identified by ECTG during the evaluation process as having been raised in one or more concerns. For efficient handling, what appeared to be similar concerns were grouped into elements early in the program, but issue definitions emerged from the evaluation process itself. Consequently, some elements did include only one issue, but often the ECTG evaluation found more than one issue per element.

Subcategory reports summarize the evaluation of a number of elements. However, the subcategory report does more than collect element level evaluations. The subcategory level overview of element findings leads to an integration of information that cannot take place at the element level. This integration of information reveals the extent to which problems overlap more than one element and will therefore require corrective action for underlying causes not fully apparent at the element level.

To make the subcategory reports easier to understand, three items have been placed at the front of each report: a preface, a glossary of the terminology unique to ECSP reports, and a list of acronyms (terms formed from the first letters of a series of words).

Additionally, at the end of each subcategory report the reader will find at least two attachments. The first is a Subcategory Summary Table that includes the following information: the concern number, a brief statement of the concern, and a designation of nuclear safety-related concerns. The second attachment is a listing of the concerns included in each issue evaluated in the subcategory.

The subcategories are themselves summarized in a series of eight category reports. Each category report reviews the major findings and collective significance of the subcategory reports in one of the following areas:

- management and personnel relations
- industrial safety
- construction
- material control
- operations
- quality assurance/quality control
- welding
- engineering

A separate report on employee concerns dealing with specific contentions of intimidation, harassment, and wrongdoing will be released by the TVA Office of the Inspector General.

Just as the subcategory reports integrate the information collected at the element level, the category reports integrate the information assembled in all the subcategory reports within the category, addressing particularly the underlying causes of those problems that run across more than one subcategory.

A final report will integrate and assess the information collected by all of the lower level reports prepared for the ECSP, including the Inspector General's report.

For more detail on the methods by which ECTG employee concerns were evaluated and reported, consult the Tennessee Valley Authority Employee Concerns Task Group Program Manual. The Manual spells out the program's objectives, scope, organization, and responsibilities. It also specifies the procedures that were followed in the investigation, reporting, and closeout of the issues raised by employee concerns.

ECSP GLOSSARY OF REPORT TERMS*

classification of evaluated issues the evaluation of an issue leads to one of the following determinations:

Class A: Issue cannot be verified as factual

Class B: Issue is factually accurate, but what is described is not a problem (i.e., not a condition requiring corrective action)

Class C: Issue is factual and identifies a problem, but corrective action for the problem was initiated before the evaluation of the issue was undertaken

Class D: Issue is factual and presents a problem for which corrective action has been, or is being, taken as a result of an evaluation

Class E: A problem, requiring corrective action, which was not identified by an employee concern, but was revealed during the ECTG evaluation of an issue raised by an employee concern.

collective significance an analysis which determines the importance and consequences of the findings in a particular ECSP report by putting those findings in the proper perspective.

concern (see "employee concern")

corrective action steps taken to fix specific deficiencies or discrepancies revealed by a negative finding and, when necessary, to correct causes in order to prevent recurrence.

criterion (plural: criteria) a basis for defining a performance, behavior, or quality which ONP imposes on itself (see also "requirement").

element or element report an optional level of ECSP report, below the subcategory level, that deals with one or more issues.

employee concern a formal, written description of a circumstance or circumstances that an employee thinks unsafe, unjust, inefficient or inappropriate; usually documented on a K-form or a form equivalent to the K-form.

evaluator(s) the individual(s) assigned the responsibility to assess a specific grouping of employee concerns.

findings includes both statements of fact and the judgments made about those facts during the evaluation process; negative findings require corrective action.

issue a potential problem, as interpreted by the ECTG during the evaluation process, raised in one or more concerns.

K-form (see "employee concern")

requirement a standard of performance, behavior, or quality on which an evaluation judgment or decision may be based.

root cause the underlying reason for a problem.

*Terms essential to the program but which require detailed definition have been defined in the ECTG Procedure Manual (e.g., generic, specific, nuclear safety-related, unreviewed safety-significant question).

Acronyms

AI	Administrative Instruction
AISC	American Institute of Steel Construction
ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
BFN	Browns Ferry Nuclear Plant
BLN	Bellefonte Nuclear Plant
CAQ	Condition Adverse to Quality
CAR	Corrective Action Report
CATD	Corrective Action Tracking Document
CCTS	Corporate Commitment Tracking System
CEG-H	Category Evaluation Group Head
CFR	Code of Federal Regulations
CI	Concerned Individual
CMTR	Certified Material Test Report
COC	Certificate of Conformance/Compliance
DCR	Design Change Request
DNC	Division of Nuclear Construction (see also NU CON)

DNE	Division of Nuclear Engineering
DNQA	Division of Nuclear Quality Assurance
DNT	Division of Nuclear Training
DOE	Department of Energy
DPO	Division Personnel Officer
DR	Discrepancy Report or Deviation Report
ECN	Engineering Change Notice
ECP	Employee Concerns Program
ECP-SR	Employee Concerns Program-Site Representative
ECSP	Employee Concerns Special Program
ECTG	Employee Concerns Task Group
EEOC	Equal Employment Opportunity Commission
EQ	Environmental Qualification
EMRT	Emergency Medical Response Team
EN DES	Engineering Design
ERT	Employee Response Team or Emergency Response Team
FCR	Field Change Request
FSAR	Final Safety Analysis Report
FY	Fiscal Year
GET	General Employee Training
HCI	Hazard Control Instruction
HVAC	Heating, Ventilating, Air Conditioning
II	Installation Instruction
INPO	Institute of Nuclear Power Operations
IRN	Inspection Rejection Notice

L/R	Labor Relations Staff
M&AI	Modifications and Additions Instruction
MI	Maintenance Instruction
MSPB	Merit Systems Protection Board
MT	Magnetic Particle Testing
NCR	Nonconforming Condition Report
NDE	Nondestructive Examination
NPP	Nuclear Performance Plan
NPS	Non-plant Specific or Nuclear Procedures System
NQAM	Nuclear Quality Assurance Manual
NRC	Nuclear Regulatory Commission
NSB	Nuclear Services Branch
NSRS	Nuclear Safety Review Staff
NU CON	Division of Nuclear Construction (obsolete abbreviation, see DNC)
NUMARC	Nuclear Utility Management and Resources Committee
OSHA	Occupational Safety and Health Administration (or Act)
ONP	Office of Nuclear Power
OWCP	Office of Workers Compensation Program
PHR	Personal History Record
PT	Liquid Penetrant Testing
QA	Quality Assurance
QAP	Quality Assurance Procedures
QC	Quality Control
QCI	Quality Control Instruction

QCP	Quality Control Procedure
QTC	Quality Technology Company
RIF	Reduction in Force
RT	Radiographic Testing
SQN	Sequoyah Nuclear Plant
SI	Surveillance Instruction
SOP	Standard Operating Procedure
SRP	Senior Review Panel
SWEC	Stone and Webster Engineering Corporation
TAS	Technical Assistance Staff
T&L	Trades and Labor
TVA	Tennessee Valley Authority
TVTLC	Tennessee Valley Trades and Labor Council
UT	Ultrasonic Testing
VT	Visual Testing
WBECSP	Watts Bar Employee Concern Special Program
WBN	Watts Bar Nuclear Plant
WR	Work Request or Work Rules
WP	Workplans

1.0 CHARACTERIZATION OF ISSUES

The 98 concerns evaluated in this subcategory are about occupational health issues. There are no nuclear safety concern in this subcategory. These concerns have been evaluated by the basic industrial hygiene approach: comparing employee exposure to the potential health hazards present in the work environment. Employee exposure are then compared to health standards and guidelines.

Industrial hygiene in an integral part of TVA's health and safety programs. Line management is responsible for complying with health standards and controlling employee exposure. Technical expertise is provided within the Office of Nuclear Power (ONP) and from the Office of Corporate Services.

The concerns were grouped into the following eleven major issues. All involve control of employee exposures to potentially harmful chemical and physical agents.

1.1 Asbestos

Asbestos is not adequately controlled to prevent employee exposure. There are twenty concerns addressed in this group.

1.2 Hydrazine

Inadequate control of hydrazine allows numerous spills and leaks which result in unnecessary exposure to personnel. There are fifteen concerns grouped in this issue. One of these concerns questions Medical Services knowledge of treating hydrazine exposure.

1.3 Polychlorinated Biphenyls (PCB)

PCBs have been spilled or leaked onto the ground in switchyards and transformers storage areas. Furthermore, there is no prevention or corrective action plan for such spills. The issue also alleges that PCBs have been improperly stored at Watts Bar Nuclear Plant (WBN). One concern stated a WBN employee was exposed to PCB and laborers were not provided with protective equipment for spill clean up. Another issue states that all utilities are required to get rid of PCBs. Eight concerns are evaluated in this group.

1.4 Hazardous Materials

There are nine varieties of employee concerns about exposure to hazardous materials or improper dumping of hazardous materials onsite. There are a total of twelve concerns in this grouping.

1.4.1 One concern involves the potential for developing polymer fume fever from the use of cleaning fluid.

1.4.2 One concern reported unknown substances entering a drain by a dumpster at Sequoyah Nuclear Plant (SQN).

1.4.3 A temporary setup is being used to pump caustic into a waste collector tank.

1.4.4 Over half of the truck drivers have health problems associated with their hauling of hazardous materials.

1.4.5 Nuclear Power (NUC PR) has no requirement to monitor chemicals for a confined space entry.

1.4.6 Painters are exposed to toxic paint fumes because they are not required to wear masks while painting in the sheetmetal shop.

1.4.7 Four identically worded concerns deal with storage or dumping of hazardous chemicals at Browns Ferry, SQN, WBN, and Bellefonte Nuclear Plant Sites.

1.4.8 An employee was exposed to a hazardous chemical at Sequoyah Nuclear Plant.

1.4.9 Filters on masks worn by painters at Kentucky Hydro Plant [illegible] changed at specified intervals.

1.5 Ventilation

Twelve concerns deal with ventilation.

Ventilation in the WBN unit 2 construction areas, primarily the Reactor Building, is not adequate to remove the dust and fumes, but management is not responsive. The air flow at the unit 2 personnel hatch is unsafe. Also, the ventilation system in the drywell at Browns Ferry Nuclear Plant is not adequate to remove heat load.

1.6 Temperature

WBN employees stay too long in hot environments because of poor judgment by the employee or because management encouraged them to stay. Also, employees experience a large temperature differential when passing thorough the air lock, causing colds and chills. Three employee concerns were evaluated in this group.

1.7 Oxygen

Four concerns about the malfunction and quality of portable oxygen monitoring equipment used by the employees at WBN were evaluated.

1.8 Fiberglass

Two employees expressed that potential health hazards are caused by the use of fiberglass cloth at WBN.

1.9 Compressed Breathing Air

The adequacy of safeguards to prevent contaminated hoses from being used for breathing air and safeguards for assuring the quality of the compressed air supplied are questionable at WBN. Two concerns comprise this group.

1.10 Miscellaneous

The issues grouped here vary widely. They generally concern sanitation, adequacy of drinking water and pest control. One of the concerns address other issues such as ventilation and lack of safety engineers for each shift. Smoking in a crew shack is another concern as is lack of training for working with argon gas. Two concerns for Kentucky Hydro dealt with paint fumes and toxic materials from sandblasting. A total of fourteen concerns make up this category.

1.11 Noise

Seven concerns were evaluated concerning three noise issues. One issue pertains to potential hearing loss and other health problems due to noise exposure at or in the Health Physics Dosimetry Laboratory; one deals with forklift noise at the construction warehouse; and the final issue deals with unexpected noise associated with the unannounced startup of a main reactor coolant pump.

2.0 SUMMARY

The following is a summary of the issues, evaluation process, findings, collective significance, causes, and corrective actions for the concerns in this report.

2.1 Asbestos

The issue raised is the adequate protection of employees from asbestos. The issue is not substantiated. The evaluation of the issue included a review of the requirements and criteria, review of employee exposure data and Industrial Hygiene Branch data files, interviews with supervisors, employees and safety staff, and observation of work practices by the evaluator.

Procedures exist at all plants which will provide adequate protection of employees. There is also an effort underway to identify and mark all asbestos insulation in the plants. This is being accomplished by labeling all nonasbestos insulation blue and stenciling known asbestos with the word "Asbestos." All insulation of unknown composition is treated as asbestos until proven otherwise. The implementation of the asbestos control program varies from plant to plant and across division lines.

Interviews with asbestos workers revealed a consensus that the control program is adequate and that they were very knowledgeable about control methods.

Observation of work practices at WBN and SQN showed the work area to be adequately identified to warn other crafts that asbestos work was in progress.

Because many of the concerns used language such as exposure "around" asbestos and the "presence" of asbestos, it is concluded that information relating to asbestos exposure has not been adequately discussed with all craft employees at WBN.

2.2 Hydrazine

Watts Bar Nuclear Plant has experienced inadvertent spills of hydrazine while transferring thirty-five percent solutions and spills of lay-up solutions (200 ppm or less). This caused employees to question the adequacy of control measures. The evaluation of these issues involved reviewing documentation on the hydrazine spills, regulatory requirements, and interviews with safety staff personnel. The issue is substantiated, but it has been corrected.

Several construction workers were "wetted" with water containing 90 ppm hydrazine in December 1983. No adverse health effects would be expected from this level of exposure; however, the employees were examined by a physician. It was found that cleanup crews did not always know when they were cleaning a hydrazine spill. Information, coordination, and planning between operations and construction groups were not adequate. Management has since developed adequate procedures for handling hydrazine and spills. A procedure was developed which requires that the pump to be flushed with water after transferring ammonia. This has solved the seal problem.

2.3 Polychlorinated Biphenyls (PCB)

The issue alleges that PCBs have been spilled in the transformer storage area and switchyards at WBN, SQN, Widows Creek and Raccoon Mountain. The issue further argues that TVA has no corrective action plan, that PCBs were stored improperly at WBN, and that all utilities are required to dispose of all PCBs. One concern said that a WBN employee was exposed to PCBs and laborers were not given protective equipment when cleaning up the spill.

The concerns were investigated by onsite visits to discuss issues with cognizant site personnel and review documentation. The issue was partially substantiated.

Transformer oils have been spilled or leaked at SQN, Widows Creek and Raccoon Mountain. An electrician was "sprayed" with PCBs while [illegible] transformer at WBN. All spills were documented and proper authorities notified. No known spills have occurred BLN. The most significant spills or leaks occurred at Sequoyah and Widows Creek. At SQN a transformer exploded on elevation 706 in the Turbine Building which required extensive cleanup and decontamination of the area. At Widows Creek a transformer was punctured while being lifting and spilled about 250 gallons of transformer oil into the river.

There are spill prevention control and countermeasures plans for each of the sites. These activities are governed by Division Procedures Manual (DPM) N75A4.

At WBN three barrels of scrap light ballasts thought to contain PCBs were stored improperly in unmarked containers. When discovered, they were shipped for disposal.

WBN transformers which contain PCBs are labeled. Charts have been prepared to show their location to aid fire fighters.

Although there is no requirement to get rid of all PCBs, the WBN site is removing them whenever major maintenance is required on transformers. This is a general commitment at all sites.

All sites have programs in place to meet regulations and to mitigate spills.

2.4 Hazardous Materials

There are nine areas of concern under this issue of employee exposure to hazardous materials or improper dumping of hazardous materials onsite.

2.4.1 One area of concern at SQN involves the potential for developing polymer fume fever from the use of cleaning fluid. The site safety personnel had implemented control methods according to manufactures instruction. According to a private doctor, the respiratory problems experienced by the employee was not related to the use of this product. Therefore, concern was not substantiated.

2.4.2 This concern is a reported incident of an unknown substance entering a drain by a SQN dumpster. The concern was not substantiated. The site investigated this incident.

2.4.3 This concern questioned the method used to pump caustics to the floor drain collector tank. This is a temporary setup at SQN to control the pH of the tank content. The plant safety staff has documented recommendations for controlling employee exposure. The investigator found the controls adequate. The concern is not substantiated.

2.4.4 This concern alleges that over one-half of the truck drivers at WBN have health problems associated with their hauling of hazardous materials. The Division of Medical Services (MED SVS) reviewed the medical records and reported 23 percent had health problems, none of these illnesses are WBN job-related. The concern is not substantiated.

2.4.5 This area of concern alleges that WBN has no requirement to monitor hazardous chemicals for confined space entry. A review of the Confined Space Entry WBN-HCE-G8 gives the requirements for toxic measurement to be made and recorded on an entry form. However, the concerns were caused by copper dust generated while removing copper tubes in a heat exchanger, which caused dermatitis (skin rash). The exposure was not expected and the condition was not present until removal of tubes began. Protective equipment and barrier creams for the skin solved the problems. The concern is not substantiated.

2.4.6 This concern stated that WBN painters are exposed to toxic paint fumes because they are not required to wear mask while painting in the sheetmetal shop. This work involved painting with a brush in a well ventilated large area. The magnitude of exposure did not require a mask. This concern is not substantiated.

2.4.7 Four identically worded concerns deal with storage/dumping of hazardous chemicals at BFN, SQN, WBN, and BLN. These allegations were investigated by Quality Technology Company (QTC) at WBN and found the issue to be invalid. The issue was discussed with environmental engineers and cognizant personnel at other sites and no knowledge of improper dumping was discovered. Procedures are in place at all sites to control hazardous wastes. The concerns in this area were not substantiated.

2.4.8 This concern stated that an employee at SQN was exposed to hazardous chemicals was investigated and found to be connected to decomposition of oil in reactor coolant pump motors. This problem was resolved in 1983 by motor modifications and by changing to another brand of oil. The odors were irritating to the eyes, but were well below the permissible exposure limits for the chemicals identified. This concern is not substantiated.

2.4.9 This concern stated that filters on masks worn by painters at Kentucky Hydro were not changed at specified intervals, but the problem was corrected according to a statement by the concerned individual made on the concern form. No further investigation was made

2.5 Ventilation

This issue alleges that ventilation in the WBN unit 2 construction areas, primarily the Reactor Building, is not adequate to remove dust and fumes and that management has been unresponsive about correcting the problem. The air flow levels at the unit 2 personnel hatch presents a safety hazard. Also, the ventilation system in the drywell at BFN is not adequate to remove heat load. A related problem was addressed with construction management concerning dust and odors in the main WBN construction office. These concerns were evaluated by reviewing environmental data taken in the Reactor Building and BFN drywell, discussion with cognizant plant personnel and review of workplans.

Planning of ventilation during the construction phase of WBN did not adequately account for the quantity and variety of work which has been required. Although the records do not indicate that the general work environment is "hazardous," dust and fumes were highly visible. Management responded to employee complaints in July 1985, by increasing general ventilation in the Reactor Building. In addition, the construction safety staff monitors the environmental conditions in the building on a periodic basis. The issue is not substantiated.

The drywell at BFN is an area where residual heat is a problem. However, two banks of five fans are in place and run during outage. In addition, a portable air conditioner can be ducted into the drywell. Administrative control procedures for heat stress control are provided in a standard practice. The issue is substantiated but adequate measures are in place to mitigate the problem.

Dust and odor problems at the main Construction Building at WBN are generally short-term nuisance problems. Dust and odors enter through the door. Water trucks wet the road during dry weather to hold dust to a minimum. This issue is not substantiated.

The personnel air lock on the 716 level of unit 2 is the primary source of outside air for the unit 2 reactor lower containment area. The air lock consists of two doors which are equipped with warning signs indication high air flow conditions within, and warning individuals that the doors should be operated with both hands. During the summer months up to 60,000 cubic feet of air is forced through this airlock each minute. While passage through this airlock can be difficult due to the high air flow and resulting pressure differential frequently encountered during its operation, the air flow nor the air lock doors themselves are considered to constitute a safety hazard. This issue is not substantiated.

2.6 Temperature

The issue states that WBN employees stay in hot areas too long due to management "encouragement" or because of poor judgment by the employee. Also, employees experience a temperature shock which causes colds and chills when passing through the air lock in the Reactor Building, unit 2.

The issue was investigated by reviewing heat stress requirements and guidelines, interviewing employees and reviewing of Occupational Safety and Health data files.

No direct findings were located on management "encouragement" of employees to remain in hot areas. Specific instances were reported of employees feeling that they, or another person, had gotten too hot. A review of heat stress reported to MED SVS showed only six reports since 1980.

Both construction and operations have a policy and procedures on heat stress. Employees interviewed had knowledge and awareness of procedures. This concern is not substantiated.

The large volume of air moved through the WBN unit 2 air lock area creates a chilling effect while passing through this area. The thirty seconds or less required for the pass-through is equivalent to going into an air-conditioned room from the outside, on a hot day. This concern is substantiated, but no adverse or long-term [illegible] reported.

2.7 Oxygen

Issues were raised at WBN concerning malfunction and the proper use, maintenance, calibration, and storage of portable oxygen monitors. It was further stated that an individual recalibrated an oxygen meter prior to use.

The evaluation of this issue required a review of instrument check out, of training requirements, and of confined space entry procedures, plus discussions with site safety staff.

Oxygen meters are stored in secure places and are under the control of responsible individuals. The construction safety staff issues all meters for construction and toolroom clerks issue meters for ONP. These groups are also responsible for issuing an operable monitor.

Employees are allowed to use meters if they are properly trained. Training is documented on class attendance rosters.

Before issue, all meters are checked for battery operation, calibration dates, and responses to oxygen in the air. The meters may require slight adjustments during the process and this does not constitute a "recalibration" of the instrument.

Oxygen monitors are calibrated on a six month interval by the Environmental Radiological Monitoring and Instrument Staff, who supplies the calibration dates affixed to the instrument.

This investigation also verified the process by observation and participation of instrument issue.

Instances of inoperable equipment did occur, the cause was related to bad batteries, bad or improper charging, and/or leaving an instrument in the "on" position. However, it is an unusual occurrence and does not represent a system failure. Adequate numbers of instruments are available. The concern is not substantiated.

2.6 Fiberglass

The issue at WBN alleges that fiberglass cloth creates dust which is potentially a health hazard. The investigation included a review of Industrial Hygiene Branch data files of employee exposure, a review of permissible exposure limits, and plant walk-throughs to determine the condition of fiberglass cloth used for welding blinds and drop cloths. The underlying cause of these concerns is the [illegible] fiberglass, like asbestos, will cause cancer.

In the absence of historical data, samples were taken to document exposure of workers welding and grinding inside a fiberglass shield. The results were two orders of magnitude below the permissible exposure limits established by the Occupational Safety and Health Administration (OSHA).

A plant walk-through was made in July 1985 to observe the condition of fiberglass drops cloths and welding shieldings. The welding shields were found to be in good shape while some drops cloths were in poor shape. A follow-up walk-through in July 1986, found some improvements because of removal of several of the poor condition drop cloths. The overall issue is not substantiated.

2.9 Compressed Breathing Air

The breathing air issue at WBN alleged that breathing air lines could be attached to contaminated drains which have the same type connector (Chicago fittings). A concern was also expressed that quality tests were not performed on the compressed air used for breathing purposes.

In order to distinguish the service air outlets from similar outlets, all service air outlets in unit 1 are marked with tags which are stenciled "Service Air." The tags are 8" x 4" oval in shape and painted gray with black letters. A Maintenance Request (MR) has been submitted to label unit 2 (currently under construction) with similar signs.

Watts Bar Nuclear Radiation Control Instruction 4 gives Health Physics responsibility for the issue and control of all breathing air systems used in contaminated areas. The instruction also requires the hoses used for breathing air to be covered with an orange plastic sleeve stenciled with the words "For Breathing Air Only." Daily inspection is required for those used more than 24 hours. The daily shift log will document the inspection and inspection documents will also exist on a tag placed at the manifold box. A caution tag is placed on the service air valve in use to prevent closure.

The existing procedures adequately address the concerns; apparently [illegible] were not aware of planned actions. The issue is not substantiated.

2.10 Miscellaneous

This section combines several concerns which are not addressed in other sections.

Six concerns in this group are about some aspect of drinking water; two are about toxic fumes and material from paint and sandblasting; three are about pests (insects, snakes, and skunks); and one each is about argon gas and smoking. The availability of drinking water concern also addressed side issues of ventilation and availability of safety engineer on all shifts.

2.10.1 Drinking Water

The issues concerning drinking water concerned the availability and sanitary condition of drinking fountains. The investigation of the issue was accomplished by plant walk-throughs, discussion with cognizant employees and review of previous investigative reports.

Observation by the investigators revealed that no serious unsanitary condition existed at drinking fountains.

Drinking water is provided on the elevation questioned, ventilation was also increased in this area. This concerned individual also expressed displeasure that no safety engineer was on the second or third shift. There is no requirement for one and there are very few employees on these shifts.
The portable water lines were installed and are cleaned in conformance with Southern Standard Plumbing Code.

2.10.2 Toxic Fumes and Materials

Concerns were also received concerning toxic fumes and materials from sandblasting and painting at Kentucky Hydro Plant. The concerned individual stated at the concern interview that the paint fumes problems were corrected in 1985. Investigation of the toxic materials concern was done by [illegible] and Hydro Power. The investigator reviewed the report and agrees with the finding that protective equipment was available and offered adequate protection.

2.10.3 Argon

One issue concerned the lack of training about the dangers of argon gas. Training requirements were reviewed and found to be adequate. Asphyxiation is the only hazard associated with argon.

2.10.4 Smoking

One complaint concerned smoking in crew shacks. No specific information pertaining to this concern was discovered. The smoking policy is adequate and the site construction office has issued a memorandum implementing the policy.

2.10.5 Pest

Concerns about skunks, snakes, and insects were investigated by reviewing reports of incidents reported to medical or safety. No skunk or snake bites were reported. Insect control is accomplished on a "as needed" basis by a contract pest control service and by plant laborers. Insect control has not eliminated insects, but control seems adequate.

None of the concerns in this issue are substantiated.

2.11 Noise

Five of the seven concerns in this group deal with the fact that noise levels are high in the Health Physics Dosimetry Lab on elevation 708 of the Turbine Building. The source of this noise is the bank of service air compressors beside the Lab Building. One concern deals with noise generated by a forklift in the construction warehouse. The final concern involved the noise associated with the startup of a reactor coolant pump. The evaluation method included, reviewing applicable noise standards, obtaining noise level data and reviewing progress on noise control measures taken.

Noise levels measured in the Dosimetry Lab ranged from 72 to 83 decibels weighted (dBA). The OSHA permissible exposure is 90 dBA. Although the noise level is below the allowable exposure, it would be very distracting to those performing the kind of work which is [illegible] in the lab. Also, normal telephone conversations would be interfered with. Efforts have been made to improve the situation. Acoustical treatments to the building were only moderately successful. Silencers have been ordered to reduce noise levels on the three largest compressors. The silencers have not been installed to date. The concern is substantiated.

Noise levels measured on the operating forklift ranged from 78 to 87 dBA. The levels are below the permissible limit.

Noise level measurements were not possible during the period of the investigation since the reactor coolant pumps were not running. However, these pumps are quite large, and are very loud when running. These containment areas are posted with signs requiring that all personnel wear hearing protection. This protection, if worn properly, will eliminate the possibility of noise damage to employee's hearing. This portion of the concern is not valid. The

concern also stated that personnel in the containment area are not informed prior to the startup of a reactor coolant pump. This portion of the concern is valid. The startup procedures at SQN and WBN will be revised to require both verbal warning and a PA announcement. The final part of this concern was about the elevated temperatures in containment caused as a result of the operation of these pumps. While a temperature increase cannot be avoided, there are administrative controls in place to limit employee exposure to elevated temperatures. This portion of the concern is not valid.

3.0 EVALUATION PROCESS

Industrial hygiene standards are found in TVA's Occupational Safety and Health Manual. Exposure limits are found in Standard 014, Threshold Limit Values (TLVs). TVA has adopted the American Conference of Governmental Industrial Hygienist (ACGIH), TLVs for 1984-85 except when a more stringent limit exists in 29 CFR 1910.1000, "Air Contaminants."

Industrial hygiene issues are evaluated by examining the potential for employee exposures to produce adverse health effects. Normal industrial hygiene evaluation involves identification, quantification and control of the hazard. In this context, the perceived hazards have already been identified by the concerned individuals as reported on the individuals forms.

Since exposure to individual hazards does not generally occur on a [illegible] it is desirable to rely on historical data bases for quantification of similar exposures. These data bases provide a range of values which allows the evaluation to access exposure [illegible]. In many cases the evaluator must rely on professional judgment and experience in evaluation of the potential for exposure. The evaluators reviewed the standards and requirements for the hazard, when they exist, for the purpose of assuring regulations are met.

The control of potential hazards may be described in terms of engineering controls, administrative controls, and the use of personal protective equipment. Engineering control includes such things as exhaust and dilutions ventilation, isolation and enclosures of processes. Administrative controls include such processes as job planning, procedures, and controlled entry. Protective equipment includes, respirators, glasses, coveralls, and other personal protectives devices. The evaluators used these attributes in measuring, to the extent possible, management effectiveness in controlling the identified health [illegible].

In most cases the individual concerns were treated as symptoms of broader issues dealing with the adequacy of controlling employee exposure. Specific requirements and documents reviewed for this evaluation are as follows:

3.1 Asbestos

Evaluation of the asbestos concerns included a review of program requirements, review of previous employee concern investigations past industrial hygiene survey reports, observation of work areas, walkdown of system and employee interviews. A list of questions was formulated which relate to the asbestos control programs. These questions were asked in informal interviews with 14 insulators at WBN to measure the implementation of the asbestos control program.

Interviews were also conducted with four insulator foremen representing the various organizations and the contractor doing insulation work at the Watts Bar site. The site safety staffs were also interviewed.

The Industrial Hygiene Branch data files were reviewed for employee exposure records.

Plant walk-throughs were conducted to determine work practices at BFN, SQN, WBN.

Documents reviewed for requirements include:

(1) WBN, HCI-HM15, Watts Bar Nuclear Plant Hazard Control Instruction, ASBESTOS, November 1, 1985.

(2) 29 CFR, Part 1910.1001 and 1926. ASBESTOS, TREMOLITE, ANTHOPHYLLITE, AND ACTINOLITE (OSHA Standard on Asbestos)

(3) Memorandum, From TVA General Manager, dated August 1, 1984, TVA POLICY ON ASBESTOS

(4) WBN, HCI-HM15a, Watts Bar Nuclear Plant Hazard Control Instruction, ASBESTOS CONTAINING MATERIALS, January 30, 1986.

(5) SQN, HCI-HM4, Sequoyah Nuclear Plant Hazard Control Instruction, ASBESTOS, March 4, 1986.

3.2 Hydrazine

The evaluation of the hydrazine issues included review of Watts Bar Hazard Control Instructions, Standard Operating Procedures for the Office of Construction, and previous incident and employee concerns investigations; plant walk-throughs and employee interviews. Documents reviewed for requirements include:

(1) WBN, HCI-HH3, Watts Bar Nuclear Plant Hazard Control Instruction, TRANSFER OF HYDRAZINE, April 30, 1985.

(2) WBN, HCI-HH4, Watts Bar Nuclear Plant Hazard Control Instruction, FILLING OF HYDRAZINE STORAGE TANK, April 30, 1985.

(3) WBN, HCI-HH3, Watts Bar Nuclear Plant Hazard Control Instruction, SULFURIC ACID AND CAUSTIC SOLUTIONS-BULK TRANSFER, June 24, 1985.

(4) WBN, HCI-HH5, Watts Bar Nuclear Plant Hazard Control Instruction, FILLING OF AMMONIA STORAGE TANK, April 30, 1985.

(5) WBN, HCI-HH7, Watts Bar Nuclear Plant Hazard Control Instruction, HYDRAZINE, October 21, 1985.

(6) WBN, HCI-HH14, Watts Bar Nuclear Plant Hazard Control Instruction, SODIUM HYPOCHLORITE, September 23, 1983.

(7) Soper, Office of Construction, Watts Bar Nuclear Plant Standard Operating Procedure, HAZARDOUS WASTE MANAGEMENT, September 4, 1985.

(8) N. Wald, J. Boreham, R. Doll, and J. Bonsall, OCCUPATIONAL EXPOSURE TO HYDRAZINE AND SUBSEQUENT RISK OF CANCER, British Journal of Industrial Medicine, February 1984.

(9) C. Haun and E. Kinkead, CHRONIC INHALATION TOXICITY OF HYDRAZINE, University of California, Irvine Toxic Hazard Research Unit, Dayton, Ohio.

Six employees were interviewed concerning the hydrazine transfer pump operations and spill clean up.

Three medical personnel were interviewed to determine if adequate information is furnished to nurses concerning hydrazine.

3.3 PCB

The evaluation of these issues consisted of a review of requirements, existing investigative reports, interviews with cognizant site personnel, and onsite observations. Requirement documents reviewed for the scope of this evaluation included:

(1) SOP-38, Office of Construction, Watts Bar Nuclear Plant Standard Operating Procedure, HAZARDOUS WASTE MANAGEMENT, September 4, 1985.

(2) WBN, HCI-HM12, Watts Bar Nuclear Plant Hazard Control Instruction, POLYCHLORINATED BIPHENYLS (PCB), March 10, 1980.

(3) BNP-FEP-3, Division of Construction, Bellefonte Nuclear Plant Field Environmental Procedure, IOL, HAZARDOUS SUBSTANCES, AND HAZARDOUS WASTE MANAGEMENT AND SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN, May 1, 1986.

(4) G-33, Division of Engineering Design, All Projects, General Construction Specification, HANDLING, STORAGE, AND DISPOSAL OF ASKAREL AND OTHER POLYCHLORINATED BIPHENYLS, March 1, 1979.

Environmental engineers for each site were contacted concerning issues.

The investigation observed the onsite storage areas at WBN and verified on a random bases that transformers in the plant were labeled.

3.4 Hazardous Materials

The evaluation of this varied grouping involved interviewing five cognizant employees at WBN, SQN, BFN and BLN and reviewing previous inspection reports of employee concerns.

Documents reviewed for requirements include:

(1) SP-WB 6.1.16, Watts Bar Nuclear Plant Standard Practice, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) MONITORING AND REPORTING REQUIREMENTS.

(2) WBN-HCI-G8, Watts Bar Nuclear Plant Hazard Control Instruction, WORKING IN CONFINED SPACES, September 23, 1983.

(3) WBN-HCI-PPE9, Watts Bar Nuclear Plant Hazard Control Instruction, INDUSTRIAL RESPIRATORY PROTECTION, July 11, 1984.

(4) WBN-WB 9.28, Watts Bar Nuclear Plant Standard Practice, RESPIRATORY PROTECTION REQUIREMENTS.

(5) SOP-38, Office of Construction, Watts Bar Nuclear Plant Standard Operating Procedure, HAZARDOUS WASTE MANAGEMENT, September 4, 1985.

(6) BNP-FEP-1, Bellefonte Nuclear Plant Field Environmental Procedure, NONHAZARDOUS AND NONRADIOACTIVE SOLID WASTE MANAGEMENT, June 24, 1985.

3.5 Ventilation

Evaluation of ventilation issues generally required review of requirements, review of existing employee concerns investigations, interviews with WBN site employees, and review of workplans. A plant tour was conducted in the Reactor Building and in the main construction office. Environmental sampling data was examined and discussed with construction safety staff.

Documents reviewed for requirements include:

(1) WBN-SP-WB 14.62, Watts Bar Nuclear Plant Standard Practice, HEAT STRESS REQUIREMENTS, August 31, 1983.

(2) WBN-HCI-G14, Watts Bar Nuclear Plant Hazard Control Instruction, HEAT STRESS, August 28, 1984.

(3) 29 CFR Part 1910.94 and part 1926.800(c), OCCUPATIONAL HEALTH AND SAFETY STANDARDS FOR INDUSTRY AND CONSTRUCTION.

3.6 Temperature

The evaluation of the concern issues required the review of appropriate requirements and the Industrial Hygiene Branch Occupational Disease Report files. Randomly selected employees were informally interviewed to discuss work in hot areas.

Specific requirements are found in the following:

(1) WBN-HCI-G14, Watts Bar Nuclear Plant Hazard Control Instruction, HEAT STRESS, August 28, 1984.

(2) EPRI NP-4453, Electric Power Research Institute Interim Report, HEAT STRESS MANAGEMENT PROGRAM FOR NUCLEAR POWER PLANTS, dated February 1986.

(3) SQN-HCI-G22, Sequoyah Nuclear Plant Hazard Control Instruction, HEAT STRESS, August 2, 1984.

A review of the Industrial Hygiene Branch files on Occupational Related Disease or Condition Reports was made to determine the number of heat-related incidences reported to MED SVS at WBN. Informal interviews with about 25-30 craftsmen working unit 2 Reactor Building was conducted. The craftsmen were asked if they were required to work unduly long in hot areas. No interview record of names was kept during these interviews.

2.7 Oxygen

The evaluation process consisted of review of requirements, and discussion with site safety personnel and a toolroom clerk. Calibration was discussed with a cognizant supervisor in Environmental Radiological Monitoring and Industrial Safety. A review of previous investigative reports was undertaken and the "checkout" process was verified by personal observation.

Documents reviewed for requirements include:

(1) TVA Occupational Health and Safety Manual Standard 006, CONFINED SPACE ENTRY.

(2) Watts Bar Nuclear Plant - Hazard Control Instruction HCI-G8, WORKING IN CONFINED SPACES.

(3) Watts Bar Nuclear Plant - Hazard Control Instruction HCI-G8(a), WORKING IN CONCEALED AREAS.

(4) TVA - Division of Construction, CONFINED SPACE ENTRY PROCEDURE, 2-82.

3.8 Fiberglass

The methods used to evaluate included a review of Industrial Hygiene Branch exposure data files, a review of current permissible exposure levels and standards, and a plant walk-through to observe the physical condition of fiberglass blankets.

A review of Industrial Hygiene Branch files showed data had been collected on employee exposure to fiberglass and included a recent sampling at Watts Bar Nuclear Plant. These samples had been taken because of employee expression of concerns.

Documents reviewed included the following:

(1) Title 29 CFR 1910.1000.

(2) TVA Occupational Health and Safety Manual, Standard 014, Air Contaminates.

(3) American Conference of Governmental Industrial Hygienist, "Threshold Limit Values for Chemical Substances for 1984-85."

(4) National Institute of Occupational Safety and Health - Criteria for a Recommended Standard for Occupational Exposure to Fiberglass.

Also, a plant walk-through was conducted to observe the use and physical condition of fiberglass cloth. The internal walk-through was made in July 1985 a follow up observation was made in July 1986.

3.9 Compressed Breathing Air

The approach used to evaluate the issues raised by the concerns was to first determine what specific requirements or standards applied. A review of those standards included the following:

(1) Title 29 CFR 1910.134(d).

(2) Watts Bar Nuclear Plant Hazard Control Instruction, PPE9, INDUSTRIAL RESPIRATORY PROTECTION, July 11, 1984.

(3) Watts Bar Nuclear Plant - Maintenance Instruction Manual - Revision 11 - (Maintenance Section Letter 2.2 , May 22, 1985.

(4) Watts Bar Nuclear Plant - Radiological Control Instruction 4 - Revision 7.

A review of the Industrial Hygiene Branch files was undertaken to verify that tests for breathing air quality had been performed.

The issues were discussed with cognizant plant personnel. Four supervisors and one technician from the HP unit, a general foreman, and the plant safety staff were contacted about the concerns of these issues. Information from these sources provided current and planned practices and the status of ongoing work.

Following these interviews a walk-through of the plant was made to determine if service air outlets on unit 1 were tagged.

3.10 Miscellaneous

The issues in this section are evaluated separately.

3.10.1 Drinking Water

Issues were evaluated by plant walk-through to observe drinking fountain cleanliness and location of drinking water facilities. Observed also was water keg filling operations. The previous investigative reports were also reviewed.

Documents reviewed for requirement includes:

(a) Radiological Hygiene Program (WBN) Radiological Control Instruction 1 (RCI-1), September 27, 1985.

(b) The Southern Standard Plumbing Code - adopted by the State of Tennessee.

3.10.2 Toxic Fumes and Materials

The investigators did not do an onsite investigation at Kentucky Hydro Plant. The report issued by the Fossil and Hydro inspection team is accepted as an adequate response.

Reference: Fossil and Hydro Power Investigation and Evaluation of Employee Concern Assignment Request for Concerns Number 00-5-001-001 through 00-85-001-012.

3.10.3 Argon Gas

Training programs were reviewed for determination of general adequacy. Previous investigation reports were also reviewed.

Specific documents reviewed:

American Conference of Governmental Industrial Hygienists, THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES, 1984-85 Issue.

3.10.4 Smoking

An attempt was made to determine specific information concerning the specific complaint. TVA policy documents and site smoking policies were reviewed.

Specifically:

(a) Memorandum from TVA General Manager, SMOKING POLICY, August 20, 1985.

(b) Memorandum from Construction Project Manager, WATTS BAR NUCLEAR PLANT - CONTROL OC SMOKING, February 8, 1984.

3.10.5 Insects, Snakes and Skunks

The issues were discussed with WBN safety staffs and medical staffs to determine the extent of the problems. A review of site efforts to control pests was also done.

References reviewed included:

(a) TVA Code, Office of General Manager, MOSQUITO CONTROL, August 11, 1986.

(b) Office of Construction QCI-.36, STORAGE AND HOUSEKEEPING, April 1, 1986.

(c) ANSI N45.2.3 - 1973, HOUSEKEEPING DURING THE CONSTRUCTION PHASE OF NUCLEAR POWER PLANTS, reapproved 1978.

3.11 Noise

The evaluation method included reviewing applicable noise standards, obtaining noise level data, and reviewing programs on noise control measures undertaken.

Permissible noise exposure levels are found in title 29 CFR 1910.95.

The Industrial Hygiene Branch files were reviewed for noise data which was taken in the areas and for review of previous investigative reports.

Correspondence and progress on corrective action was also reviewed. Design Change Request Number 559 and Engineering Change Number 5701 pertain to request for noise control measures.

Site procedures reviewed included:

a. WBN, SOI-68, Watts Bar Standard Operating Instruction, REACTOR COOLANT PUMP STARTUP

b. SQN, SOI-68, Sequoyah Standard Operating Instruction, REACTOR COOLANT PUMP STARTUP

c. SQN, HCI G-22, Sequoyah Nuclear Plant Hazard Control Instruction, HEAT STRESS, August 2, 1984

4.0 FINDINGS

The issues addressed by this subcategory frequently have implications at other ONP sites. The findings and conclusions of the hydrazine, asbestos, and noise issues for example, may have broader implications. In reality, such aspects are being addressed through the development of ONP Standards (which are generic documents for all ONP) and through the development of site procedures (which deal with one site's circumstances).

4.1 Asbestos - Findings

Discussion

Asbestos has been used extensively in the electric power industry for many years. It is thermally insulating, chemically inert, naturally occurring, and inexpensive. All of these properties made it an ideal insulator choice. In the early 1970's, OSHA set a standard permissible exposure level of five fibers per cubic centimeter of air. This standard was based primarily on the long-term chronic effect on the lungs. Subsequent data showed asbestos to be related to cancer production in man. The standard was lowered to two fibers per cubic centimeter of air. In 1984, TVA adopted one-half fiber per cubic centimeter as a target standard. Included in the policy change was a commitment to stop the procurement of asbestos containing materials unless a substitute could not be found.

Conclusions

4.1.1 Generic

The issue raised by these concerns are not substantiated; employees are adequately protected.

Asbestos cloth is used as an outer covering for insulated pipe, ducts and other equipment. Major installations of the original insulating materials was done by contract personnel. A health and safety clause was part of the contract document which contained asbestos control procedures. All plants have underway a program to replace asbestos with nonasbestos materials. This will be accomplished as the insulation is removed during outage or maintenance work. In addition, the plants have a program to identify and mark asbestos materials.

All employees interviewed were well aware of the hazards of asbestos and had discussed protective measures during safety meetings and/or as part of employee training.

It is the finding of the investigators that all plants have procedures in place to adequately control asbestos exposures. Protective equipment is available and used as required. All plants treat insulation work as asbestos work until proven otherwise.

4.1.2 Site Specific

4.1.2.1 Browns Ferry

No employee concerns pertaining to asbestos were received. However, BFN has the most asbestos of any plant; therefore, it has the greatest potential for employee exposure.

4.1.2.2 Sequoyah

All five employees interviewed felt that asbestos control program was adequate. An observation of work in progress showed the area to be adequately posted and employees observing proper procedures.

Shower facilities and protective clothing are available to crafts other than just the insulators who work with asbestos.

A walk-through survey of the plant was made in September 85 to determine the deterioration of insulation. The general condition of the asbestos cloth was good. There were some small areas where the cloth was overlapped that were frayed.

A review of the exposure data showed only 2 samples, out of 197 taken since 1971, exceeded the permissible exposure level (one in 1976 at 2.3 fibers per cubic centimeter and 2.2 fibers per cubic centimeters in 1984).

4.1.2.3 Watts Bar

The only asbestos used for insulation is asbestos cloth. No other insulating materials were found by review of specifications and a random sampling of 20 locations in the plant.

Asbestos cloth is labeled and nonasbestos insulating material is painted blue.

Samples of accumulated dust were taken at several building locations and found to be free of asbestos. Specific concern was expressed about the existence of asbestos in the Life of Plant Document Vault in the Control Building, currently this area is used for the Technical Support Center. The room contained no asbestos.

Employee exposure monitoring records since 1980, showed no exposure in excess of the allowable limit.

The boric acid tank rooms contain asbestos. Work around the tanks does not present an exposure hazard. The cloth is treated to control the release of airborne fibers.

All 15 employees interviewed, with the exception of one insulator, felt that the asbestos control program was adequate.

One employee expressed concern over asbestos exposure from cadwelding at Hartsville in 1978-79.

The supplier of Hartsville's cadweld materials, ERICO, Products Inc., began furnishing nonasbestos sleeve mold packing (aluminum silicate) to all its customers in August 1977. ERICO disposed of their existing stocks of asbestos packing at that time, but advised their customers to use and deplete existing supplies of the asbestos packing. Their actions were based on the results of testing done by a independent laboratory on the danger from asbestos that stick to the cadweld rebar splices. These results showed that the exposure to airborne asbestos fibers was considerably below the acceptable OSHA level of two fibers per cubic centimeter of air.

The date when the Hartsville stock of asbestos packing was depleted and the use of nonasbestos material began could not be established; however, it is unlikely that the limited supply could have lasted past the first quarter of 1978. Based on the vendor's laboratory results, any exposure during this time period would have been below OSHA limits.

4.1.2.4 Bellefonte

Extensive testing of insulation installed and stored at BLN showed no asbestos insulation present at the site.

4.2 Hydrazine - Findings

Discussion

Hydrazine is used at TVA Nuclear Plants as an oxygen scavenger, primarily in lay-up solutions which contain 200 ppm or less of hydrazine. It is received at the sites as a 35 percent concentration in water, shipped in 55 gallon plastic or plastic lined drums.

The American Conference of Governmental Industrial Hygienists (ACGIH) has classified hydrazine as a suspected carcinogen and has set a recommended Threshold Limit Value (TLV) on airborne hydrazine of 0.1 parts per million (ppm). The primary exposure route is skin contact.

Conclusions

The issues raised by the concerns were valid at the time they were submitted. Management action has since adequately controlled exposure to hydrazine.

4.2.1 Site Specific

4.2.1.1 Watts Bar

The investigations revealed that WBN has experienced spills of lay-up solutions (200ppm or less) in the plant proper and 35 percent hydrazine while pumping from the receiving drums into the plant tank and piping system.

This pumping operation is done at the Acid and Caustic Building where the 35 percent spills occurred as a result of pump seal leaks. Very small volumes were leaked.

The small leaks have occurred for several years and began with the first use of hydrazine on the project

The pump leak spills resulted in no reported exposures because of their remote location and the fact that procedures were followed and the required personal protective equipment was used. The cause of the pump seal failures was determined to be residual ammonia left in the pumps. The pump operators are now required to flush the pumps with water after pumping ammonia and no seal failures have been reported since the practice was started, about one year ago. HCI-HH5 was amended April 30, 1985 to include this practice.

Leaks from pipe flanges, overflow, and valves have resulted in spill of diluted hydrazine solutions. The lay-up spills resulted in some unprotected employees being wetted with the very dilute hydrazine. A spill on December 16, 1983, exposed several construction laborers to a concentration of approximately 90 ppm hydrazine. Those employees who experienced skin contact were examined on site by a physician and showed no signs of adverse health effects consistent with overexposure to hydrazine.

It is now required that before a clean-up of spilled liquids is started the chemical laboratory must sample the material and determine the composition and concentration, if a toxic material. This adequately identifies hydrazine spills. HCI-HM16 implements these requirements.

An employee reported to construction medical at WBN with a hydrazine exposure. The nurse was not familiar with hydrazine. This situation has been corrected by supplying Material Safety Data Sheets on all chemicals used at WBN for MED SVS.

4.3 Polychlorinated Biphenyl (PCB) - Findings

Discussion

PCBs have been used for many years as insulating oils in electric transformers. They are able to withstand relatively high temperatures and they are not highly volatile. Because of their low volatility, PCBs do not present a significant inhalation hazard. The main health concern is skin absorption and hazardous decomposition products created by fires. PCBs present an environmental hazard because they exist unchanged in the environment for long periods of time. In other words, they do not biodegrade easily and as a result there is a general environmental buildup including deposition in man.

PCBs have not been proven to cause cancer in man.

In 1981, the Environmental Protection Agency imposed strict regulation of PCBs. The regulations called for strict monitoring of their use and disposal.

The regulations did not ban the total use of PCBs. It did contain provisions for the phase out of PCB use where public contact was likely, such as, food preparation and livestock feed production facilities. Many electrical distribution facilities (transformers) are located in public buildings and residential areas which are easily accessible by the public. This caused some "utility companies" to dispose of their PCBs.

Conclusions

The concerns claiming TVA has spilled and leaked PCBs is substantiated. However, TVA does have control plans and procedures, and there is no ban on the use of PCBs for transformers. The portions of the concerns dealing with these issues are not substantiated.

In compliance with Federal Regulations, TVA labels PCB containing devices. During transfer of PCB, drip pans and/or dikes are used to contain any spills. PCB containing devices are inspected and records kept. The spills of PCBs have been because of accidental conditions such as fires or physical rupture.

4.3.1 Generic

There is no regulation banning the use of PCBs for transformer oil.

4.3.2 Site Specific

Watts Bar

PCB containing transformers are clearly marked and their location noted on charts that are provided to the fire brigade.

The site replaces the PCB oil as work is required on the transformers.

There has been one instance of improper storage of PCB containing devices. Three barrels of scrap light fixture ballasts were stored in containers which did not have labels. When the material was discovered, it was shipped for disposal.

There has been one incident of an electrician, opening a transformer, being sprayed with transformer oil containing approximately 41 parts per million PCB. The employee was examined by Medical Services and provided new clothing. Another electrician was purchased new boots because his were contaminated. The spill was cleaned up by electricians (not laborers) using protective clothing. The waste material was removed and sent to hazardous waste. The release was inadvertent and the cleanup followed required procedures. G-33, Division of Engineering Design, All Projects, General Construction Specification, Handling, Storage, and Disposal of Askarel and other Polychlorinated Biphenyls, (3-1, 79).

Sequoyah

A transformer explosion and fire occurred at SQN in 1982. The transformer was located on elevation 706 Turbine Building. This resulted in a sizeable cleanup and decontamination of the area. The incident is well documented in plant correspondence. A TVA report on SQN, unit 1, Isolated Phase Bus Failure Report was completed on this incident. In another incident a small leak in the switchyard resulted in one barrel of rock and dirt being removed and disposed.

Bellefonte

BLN removed its PCB-containing transformers and no incidents are known.

Other

The concerned individual is correct in that spills/leaks have also occurred at Raccoon Mountain and at Widows Creek Steam Plant. The most significant occurrence was at Widows Creek in 1984. A transformer contained PCBs was ruptured while lifting and approximately 150 gallons of oil leaked into the river. The incident is documented and proper authorities were notified.

Hazardous Materials - Buildings

Discussion

This group of concerns cover several different materials, some unknown, and relate to four nuclear plants and Kentucky Hydro Plant.

Conclusions

Generic

4.4.1 The first stated that a potential exists for developing polymer fume fever from using Vydax-Freon for cleaning. The manufacturer of the material confirmed that in combination with smoking it was possible. The site safety staff had implemented control measures including, no smoking, within the work area. Respiratory problems experienced by an employee was not related to product use. Therefore the issue is not substantiated.

4.4.2 A Sequoyah concern was that, "materials of unknown origin or substance are being emptied into drain in from of dumpster." Discussions with cognizant supervisors and engineers at the plant showed that none were aware of any hazardous materials having been emptied in this drain. The concern is not substantiated.

4.4.3 The second Sequoyah concern was about three drums of caustic in Auxiliary Building, Elevation 653, from which additions of caustic are made to the floor drain collector tank.

Investigation showed that the drums are in use temporarily until a permanent caustic tank is installed. The plant safety staff recommended protective action to be taken until the permanent tank is installed. A review of the protective action leads this evaluator to conclude that it is adequate to protect employees. Hence, the concern is not substantiated.

4.4.4 A concern stated that over one-half of the 57 truck drivers on the WBN project had serious health conditions which were related to hauling hazardous materials. MED SVS reviewed the medical history of the truck drivers and found that 23 percent of the truck drivers had medical conditions. Many predated their employment at this site and were not occupationally related. Furthermore, medical stated that the health status of the drivers was consistent with the general population for this age distribution.

4.4.5 A WBN concern stated there were no requirements to verify what chemical hazard exists in a vessel when a confined entry permit is issued. With the assistance of QTC, it was learned that the job in question was the retubing of a 3200 tube, 60 ft. long CCS heat exchanger. The individual stated that he had received chemical burns, but had not reported to medical for treatment. A chemical check of the residue inside the vessel showed nothing chemically that might have caused the problem; only very fine copper/nickel particles shaved off the tubes as they were pulled out. Copper dust is known to cause dermatitis. When the safety staff was notified by the lab of the copper dust in the vessel they directed that workmen inside the vessel wear coveralls taped at wrist and ankles, use barrier cream on all exposed skin, and wear respiratory protection. When the workmen were protected from the dust the skin problems vanished. Other heat exchangers have since be retubed using these same protective measures and no problems have been experienced. The concern is substantiated, but has been corrected.

4.4.6 A painter working in the WBN construction sheet metal shop was not required to wear a respirator while painting. This painter was the only painter in this shop and was touching up new sheet metal work that had damaged spots in its zinc coating. He used a very small brush, painted from a quart can, worked near the center of a well ventilated 60 ft.x 160 ft open shop building. He averages two to three gallons of paint per week. The exposure level was so low that no respiratory protection was deemed necessary by the investigator, therefore the concern is substantiated.

4.4.7 Four of these concerns, one about each of the nuclear plants are identical. They all state that hazardous materials are being stored/dumped in an uncontrolled manner. QTC did an investigation of the concern for WBN. They contacted the concerned individual who alleged that this was Sequoyah materials which were dumped at WBN. QTC identified the area, sampled extensively for both radiological and chemical contamination. The samples taken did not reveal any elements of chemically dangerous materials or reactor decay by products. QTC declared the concern "not substantiated."

At each of the three remaining nuclear plants cognizant engineers and supervisors were contacted about the alleged uncontrolled dumping or storage at their plants and none knew of such activity. Procedures controlling the disposal of both chemical and radioactive materials are established for

4.4.8 A SQN concern simply stated, "individual exposed to hazardous chemical." QTC obtained additional information from the concerned individual that indicates this concern stemmed from a problem of oil decomposition because of heat in the reactor coolant pumps. The Industrial Hygiene Branch conducted several surveys during 1982-83 to determine the atmospheric concentration of these products. All of the survey data showed the products of decomposition in the atmosphere to be well below (less than one-tenth) the maximum permissible exposure levels. However the Industrial Hygiene branch recommended the use of full-face respirators with GM A-H cartridges in both upper and lower containment of Reactor Building 2 until the pump oil was changed and modifications made to the unit 2 pumps. The recommendation was made because the products were very irritating to the eyes and upper respiratory tract. When these actions were completed on October, 1983 the problem was resolved. The concern is partially substantiated, but has been corrected.

4.4.9 One concern from Kentucky Hydro stated that filters on masks, worn by painters, were not changed at specified intervals. The concern further stated that the problem had been corrected. No further investigation was made.

4.5 Ventilation - Findings

Discussion

Most of the concerns relate to smoke, heat, dust, and fumes in different areas of WBN unit 2 Reactor Building. They are grouped together because adequate ventilation is generally the only practical solution to problems of this nature.

Conclusions

The findings do not show any uncorrected problems; management has been responsive in controlling health hazards to acceptable levels.

There are no heat stress standards issued by OSHA.

4.5.1 Site Specific

4.5.1.1 Browns Ferry

The drywell at BFN is an area where residual heat removal is a problem.

The heat load in the drywell is a function of outside temperatures and length of time since reactor shutdown. The only practical solution is the use of administrative controls and auxiliary cooling.

Ten fans are in place and are run during outages. A large portable air conditioner is available but apparently has not been used based on employee interview.

Browns Ferry Standard Practice 14.42 Heat Stress provides administrative procedures and guidance.

A review of the number of heat related incidents reported to medical over the past several years have declined. None were reported in 1984 and 1985.

4.5.1.2 Watts Bar

In response to one of the concerns expressed early in the program, a plan to increase airflows in unit 2, Reactor Building (RB-2) was developed. The resulting workplan No. B0127 was completed on July 8, 1985. The work increased airflows which in turn increased the removal of contaminants and heat from the building. Discussions with employees who had worked in RB-2 for several months substantiated that the "air quality" had improved.

As unit 2 moves closer to completion, there will be a continuing decrease in welding, cutting, and grinding activities which will reduce airborne contaminants and generated heat. Another factor that should improve the working atmosphere is the decreased number of construction workers. Some of the employees who had worked in RB-1 stated that when RB-1 reached RB-2's present stage of completion, the "air quality" conditions improved greatly and rapidly in RB-1; they felt that the same would be true in RB-2.

The construction safety staff monitors the environment in RB-2 when temperatures or airborne contaminants may pose a health hazard. A review of the environmental monitoring data available from the construction safety staff and the Industrial Hygiene Branch did not indicate that conditions in RB-2 had been hazardous. The construction safety staff stated that if a hazard did exist and could not be corrected by engineering means work would be stopped.

Employee interviews and observation by the investigators revealed that dust and odor problems at the WBN main construction office building is caused by fugitive dust generated by vehicular traffic. The dust is controlled by water sprinkling as needed.

The personnel air lock on the 716 level of unit 2 is the primary source of outside air for the unit 2 lower containment area. During the summer months up to 60,000 cubic feet of outside air is forced inside unit 2 each minute by temporary blowers located outside and east of the shield wall. All of this air volume must pass through this personnel hatchway/air lock.

The air lock consists of two metal doors which are equipped with warning signs indicating high air flow conditions within, and warning that the doors should be operated with both hands. In addition, the two doors have an interlocking system of warning lights indicating when the other door is closed. The doors and the door latching mechanism are installed properly and are designed safely.

While the high air flow frequently encountered within this air lock during the summer months is an undesirable condition, due to the ventilation requirements for unit 2 containment, it is largely unavoidable. Even though passage through this air lock can be difficult due to the high air flow and the resulting pressure differential, neither the air flow nor the air lock doors themselves are considered to present a safety hazard when proper caution is exercised.

4.6 Temperature - Findings

Discussion

There are only two concerns about temperature. One is that management urges employees to stay in hot areas too long and that employees sometimes stay too long of their own choice. The other concern stated that the temperature differential one experiences on leaving or entering RB-2 through the air lock at elevation 716 often gives craft personnel colds or chills.

There are no health standards which apply to heat stress. Heat stress guidelines used in ONP were developed by TVA based on nuclear industry experience and TVA experience at BFN.

Conclusions

The issues concerning temperature are not substantiated.

4.6.1 Watts Bar

The investigators were unable to find specific incidences where management "encouraged" employees to work too long in hot areas. A review of the Occupational Health and Safety files showed only six heat related incidents were reported to MED SVS since 1980 at the WBN site. Considering the number of employees and the nature of the work, this is unusual.

Watts Bar Nuclear Plant Hazard Control Instruction (HCI) G14, Heat Stress, places the responsibility on the supervisor for evaluating the work hazards and providing the protection needed. When requested by supervisors or individuals, the plant safety staff will do heat stress surveys that tell the expected effects on the average physically fit person. As the HCI states, nothing should take precedence over the employee's health. Proper diet, adequate consumption of liquids, sufficient rest between work shifts, and maintenance of general fitness should keep the employee out of trouble when working in heat.

The temperature differential which concerned the employee is mostly due to the very large volume of fast moving air going through this area as part of the efforts to ventilate the reactor building. The average travel time through this cooling air stream averages only about 30 seconds and should present less thermal shock on the human body than walking into a air conditioned building from outside on a hot summer day. The issue is highly subjective and dependent on employee perception.

4.7 Oxygen - Findings

Discussion

Portable oxygen monitors are used to determine oxygen levels in confined or concealed spaces. The concern relates problems of malfunctioning oxygen meters and questions the methods of storage and calibration.

Conclusions

Concerns relating to oxygen monitoring instrumentation are not substantiated.

4.7.1 Watts Bar

Oxygen meters are stored in several places and are under the control of responsible individuals.

Currently, the construction safety office issues all oxygen meters. Previously, all meters were issued by storeroom clerks who were responsible for issuing an operable instrument.

NUC PRs meters are issued by toolroom clerks who are responsible for issuing an operable instrument.

Employees are allowed to use oxygen meters if they are properly trained. Training is documented by class attendance rosters.

Meters are calibrated on a six month interval and have stickers showing calibrations date and date due for calibration.

Before issue, all meters are checked for battery operations, calibrations data, and response to oxygen in air. During this process the instrument may require slight adjustment based on air and zero response.

4.8 Fiberglass - Findings

Discussion

The ACGIH and OSHA set allowable respirable exposure levels of 10 milligrams per cubic meter (mg/m^3). Ten milligrams per cubic meter is a very heavy concentration of respirable dust. Respirable dust in this concentration is seldom found even in dusty operations such as coal and fertilizer handling facilities at TVA.

The National Institute of Occupational Safety and Health (NIOSH) has found no evidence that occupational exposure to fiberglass causes cancer.

Conclusions

The fiberglass issue is not substantiated.

4.3.1 Watts Bar

In July 1985, the Industrial Hygiene Branch conducted personal sampling on two WBN employees who were welding and grinding within a fiberglass cloth-shielded enclosure. At the same time area samples were taken around the shields at distances of 4, 6, 12, and 30 inches.

Since it was necessary to determine the amount of fiberglass in the sample, the filters were examined under a microscope and the fiberglass particles were counted and sized. One of the employees received a time-weighted averaged (TWA) exposure of 0.033 fiber per per cubic centimeter (f/cc) of air, and the other received a TWA exposure of 0.036 f/cc. The area samples ranged from less than 0.01 to 0.06 f/cc. These results are far less than the allowable exposure levels of 10mg/m^3 which is approximately 6.0 f/cc.

It is concluded that the normal use of fiberglass cloth does not present a significant health hazard. Fiberglass fiber level found were two orders of magnitude lower than permissible limits.

A walkthrough of the plant was conducted in July 1985 to determine the condition of fiberglass cloth in use. It was found that the welding shield were in good shape while some cloth used for drop cloths was badly in need of replacing. A follow-up, made in July 1986, found that some drop cloth had been removed and replaced.

4.9 Compressed Breathing Air - Findings

Discussion

Compressed air is used for breathing air in areas where contamination levels exceed the protection factor for filter type respirators. Compressed air used for this purpose must meet quality standards established by the Compressed Gas Association. Hose connections for air are the same for other systems such as now service water and certain tank and system drains.

Conclusion

The breathing air issue is not substantiated.

4.9.1 Watts Bar

WBN Maintenance Instruction Letter 7.2, requires the service air systems to be evaluated for breathing air quality on a six month interval. The Industrial Hygiene Branch performs the tests for comparison to the Compressed Gas Association Specifications G-7.1 - 1966. The air must meet Grade D, as a minimum, and the air is also compared to higher requirements of Grade - E although meeting such standards is not mandatory. Records indicate that the air has been tested and passed as required.

In order to distinguish the service air outlets from similar outlets, all service air outlets in unit 1 are marked with tags which are stenciled "Service Air." The tags are 8" x 4" oval in shape and painted gray with black letters. A plant walk through verified this information. A MR has been submitted to label unit 2 (currently under construction) with similar signs.

WBN Radiation Control Instruction 4 gives Health Physics responsibility for the issue and control of all breathing air systems used in contaminated areas. The instruction also requires that the hoses used for breathing air will be covered with an orange plastic sleeve stenciled with the words "For Breathing Air Only." Daily inspection is required for those used more than 24 hours. The daily shift log will document the inspection and inspection data will also be on a tag placed at the manifold box. A caution tag is placed on an in-use service air valve to prevent inadvertent closure.

4.10 Miscellaneous - Findings

Discussion

This report combines concerns about areas of the industrial hygiene field that are not otherwise addressed in this report. Six concerns in this group are about some aspect of drinking water; one each is about argon gas and smoking; two are about toxic fumes and material from paint sandblasting; three are about pests (insects, snakes, and skunks); a side issue in one of the drinking water concerns question the lack of safety engineer on the second and third shift, and the adequacy of ventilation in the Reactor Building.

Conclusions

4.10.1 Watts Bar

4.10.1.1 Drinking Water Concerns

None of the drinking water concerns were found to be substantiated at the time the investigations were done. The concerns evaluation started in the spring of 1985. A walk-through survey of drinking water facilities, performed in July 1986, reconfirmed either no obvious problems exist or that if they had existed, corrections have been made.

Concerning the availability of drinking water, two Igloo coolers of cold water were at the top of the spiral stairs elevation 803, unit 2 Containment Building during the July 1986 walk-through. Several workers at that location said that there was always water and that the service crew for the coolers did a pretty good job.

Included in the same concern were a side issue of ventilation in unit 2 containment, elevation 813 and the lack of a safety engineer on the second and third shifts.

Airflows have been increased in this area by rearranging the fan and duct systems and adding two temporary fans. This work was done on Workplan No. B0127 and completed on July 8, 1985. October 2, 1985, discussions with employees working in this area confirmed that the work done had improved the situation. The Construction Safety Staff does not currently have a safety engineer assigned to the second or third shift, as mentioned in the concern.

Line management and employees are responsible for safe working conditions. The lack of a shift safety engineer does not hinder safe work performance. The concern is not substantiated.

Another concern alleged that proper installation and cleaning of water lines was not accomplished. This was investigated by the Industrial Safety Staff with the following findings.

The Southern Standard Plumbing Code recommends either a disinfection solution containing 50 parts per million of available chlorine and a contact time of 6 hours, or a solution containing 100 parts per million of available chlorine and a contact time of 2 hours.

The Industrial Safety Engineering Staff conducted an investigation at the site and learned that the procedure utilized at WBN exceeds the Southern Standard Plumbing Code. Hypochlorite solution is added to the water line until a concentration far in excess of 100 parts per million is obtained and held in the line for 24 hours. The line is then flushed with potable water. Following the flushing operation, water samples are taken for chlorine residual and bacteriological analysis. Upon obtaining negative bacteriological analyses for two successive days, the system is considered safe.

The Southern Standard Plumbing Code (Tennessee Code) allows for the installation of water service and sewer lines in a common trench provided the following conditions are met.

(1) The bottom of the water-service pipe is at all times at least 12 inches above the top of the sewer line at its highest point.

(2) The water-service pipe is placed on a solid shelf excavated at one side of the common trench.

An investigation of the concern was conducted by the Industrial Safety Engineering Staff. A site visit and a discussion with the responsible Construction supervisor indicates that there are approximately 1000 feet of water-service pipe and sewer line in a common trench. Information provided indicates that the water line is properly installed and is in accordance with the Tennessee Code. The supervisor stated that in most cases the sewer line was about 4 feet deep and that the water line was about 18 inches above the sewer line. This distance exceeds that required by the code.

4.10.1.2 Toxic Fumes and Materials

Neither of the concerns dealing with toxic fumes and materials from painting and sandblasting at Kentucky Hydro Plant were found to be valid. The concern dealing with fumes from painting was stated by the concerned individual then followed by his statement that, "This problem was corrected in February 1985."

The investigation of the Kentucky Hydro concern dealing with toxic materials from sandblasting showed that personal protective equipment was available and if used properly should very adequately protect the employees.

4.10.1.3 Argon

The one concern about argon gas deals with the lack of training on the dangers of argon gas. Asphyxiation in confined areas is the only significant hazard associated with argon and training on working in confined space has been given to all employees likely to need it. No additional training should be required, therefore, this concern is not substantiated.

4.10.1.4 Smoking

Smoking in the crew shack was the subject of one concern by one individual out of the whole WBN Work Force. That individual expressed his/her concern in an exit interview on leaving the work force. Because of lack of information available as to which of the many crew shacks this individual was referring or at what time the problem existed, the concern could not be substantiated. Memorandums from the general manager, dated August 1985, and from the construction project manager, dated February 1984, states the smoking policy and offers assistance to solve individual problems to any employee who requests it.

4.10.1.5 Pests

Insects, snakes, and skunks were the subjects of concerns that have all been determined to be invalid. There are insects, snakes, and skunks in and/or around the site, but investigation has shown that no employees have reported bites by snakes or skunks. Spraying for insects is done by contracted pest control service and by plant laborers. The insect control efforts have been successful in holding this problem to a very low level.

4.11 Noise

Discussion

For the prevention of hearing loss, OSHA sets a permissible noise exposure for an eight-hour work day at 90 decibels A-weighted (dBA).

Conclusions

4.11.1 Site Specific

4.11.1.1 Watts Bar

Five of the seven concerns in this subcategory deal with the fact that noise levels are high in the Health Physics Dosimetry Lab on elevation 708 of the Turbine Building. The source of this noise is the bank of service air compressors beside the Lab Building.

Sound level measurements were taken in the Dosimetry Lab, both before and after it was occupied. Measurements ranged from 72 to 83 dBA, depending on the location inside, the number of doors open, and how many and which compressors were running outside. These measurements do not substantiate concerns for possible hearing loss. They do show, however, that this would be an uncomfortable work location.

Since these concerns were expressed, work has been done on the building in an effort to reduce the noise level inside. Measurements taken after the building modifications showed a slight improvement, but not enough to consider the problem solved. Intake silencers have been ordered and are on site for the three largest compressors. If these silencers are effective when installed, a noticeable improvement should result.

One other noise concern is of the noise from fork lifts operating in the construction warehouse.

In order to determine how much noise the forklifts generate in warehouses, an investigator visited the site on October 23, 1985, and measured the sound levels of the forklifts operating in the main construction warehouse and in warehouse no.28. These measured sound levels duplicated closely those to which workers are exposed.

The noise levels ranged from 78 to 87 decibels A-weighted (dBA) depending on the speed the engine was required to run to do it's job. The A-weighting is that weighting of the frequency components which most nearly equals what the human ear hears.

In addition to the OSHA limits, TVA sets its target exposure limit at 85 dBA for the 8-hour workday. Since the warehouse forklifts very seldom operate even close to a continuous 8-hour shift, the average shift exposure would be well below TVA's target level of 85 dBA for either the operator or other warehouse personnel. As stated, the forklifts do generate noise but, based on current scientific evidence, these noise levels are not expected to produce hearing damage. The concern is not substantiated.

4.11.1.2 Watts Bar and Sequoyah

The final noise concern is about the unexpected noise associated with the unannounced startup of a main reactor coolant pump, and the elevated temperatures within containment which result from the operation of such pumps.

Standard Operating Instruction (SOI) 68 governs the startup of the reactor coolant pumps at both WBN and SQN. This SOI does not require that employees working in the area be informed that a pump is to be started. It does; however, require that a visual inspection of the area be performed by an AUO prior to startup. Operational supervisors at WBN and SQN were contacted concerning the need to better inform employees of a pending pump startup. They agreed to revise SOI-68 at both sites to require that (1) the AUO conducting the visual inspection would notify all personnel within the area of the pending pump startup, and (2) an announcement will be made on the plant PA system prior to startup. This will eliminate any possible safety hazard associated with the unexpected startup of these coolant pumps.

Elevated temperatures within the containment area are unavoidable during operational and startup modes. However, exposure to such elevated temperatures within this area is limited during plant operation. In addition, there are administrative controls such as SQN HCI G-22 that, when properly implemented, reduce employee exposure to elevated temperatures.

While these reactor coolant pumps are noisy during both startup and operational modes, the containment areas are posted with signs requiring that all personnel wear hearing protection. This protection, when worn properly, will eliminate the possibility of noise-related hearing damage.

5.0 COLLECTIVE SIGNIFICANCE

Management has not been effective in communicating the relative hazards of chemicals and materials in the workplace to the employees, nor have they been wholly effective in ensuring that employees are aware of the various control programs in place to mitigate employee exposure.

The following is a issue by issue discussion of the collective significance with emphasis on its impact on site operations. Because of the nature of the issues addressed by this subcategory, the collective significance may have implications at other ONP sites.

5.1 Asbestos

5.1.1 Management Effectiveness

Management has not effectively communicated the relative hazards of using asbestos to all crafts working in the plant. They have also not effectively communicated the asbestos control program to all crafts.

5.1.2 Employees Effectiveness

In recent years, much information has appeared in the popular press and in trade journals concerning the health hazards associated with asbestos. This has created an awareness on the part of all employees which in turn has resulted in employees questioning the existence of any asbestos in the work environment.

5.2 Hydrazine

5.2.1 Management Effectiveness

The majority of spills and employee exposures to hydrazine has resulted from the lack of adequate information and communication among organizations and crafts involved.

5.2.2 Employee Effectiveness

The lack of employee knowledge concerning the hazard posed by hydrazine and/or the lack of control procedures, including medical procedures, increases the risk of employee exposure.