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U.S. AIR FORCE MATERIEL COMMAND's SECOND ROUND ECAMP RESULTS*

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INTRODUCTION

The United States Air Force's Environmental Compliance Assessment and Management Program (ECAMP) is a process to improve Air Force environmental compliance, management, and programmatic support. Midway into the third round of Command-initiated (external) ECAMP evaluations for its fourteen Air Logistics and Systems Centers, the Air Force Materiel Command (AFMC) is continuing to identify the root causes of instances of environmental noncompliance. The AFMC initiated an analysis of all negative findings identified during the second round of external ECAMP evaluations (June 1991 to January 1993). Presented here is a summary of the analysis with emphasis on trends and root causes.

BACKGROUND

Currently, Air Force Policy Directive (AFPD) 32-70, Environmental Quality, directs Air Force compliance with applicable Federal, State, and local environmental laws and standards. Implementing AFPD 32-70, Air Force Instruction 32-7045, Environmental Compliance Assessment and Management Program directs environmental compliance evaluations of Air Force operations and activities and provides instructions to assign noncompliant findings with Finding Identification Codes.

To facilitate the analysis of negative findings, we employed the Finding Identification Codes prescribed in the ECAMP process. Finding Identification Codes are a couplet of keywords composed of Finding Category Codes (FCCs) and Violation Type Codes (VTCs). Since the implementation of requirements set forth in the January 1991 ECAMP manual, the AFMC has expanded the list of FCCs (Table 1) and VTCs (Table 2) to more accurately describe the variety of conditions frequently encountered at its installations. The new codes have not been arbitrarily assigned, but result from a thorough review and reassignment of keywords to all negative findings documented during the ECAMP evaluations.

Combined, the couplet describes a noncompliant condition and provides the basis for looking across the Command for noncompliance trends and building supporting financial programs for

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environmental requirements. The resulting Finding Identification Codes have been broadly adopted for the (new) ECAMP manual and the multi-service TEAM Guide. Finding Category Codes beyond the key word "Others" in Table 1 are additions since publication of the January 1991 ECAMP manual. An asterisk indicates additional codes identified since the June 1994 edition of the ECAMP manual.

TABLE 1. AFMC Finding Category Codes

Air Emissions
- 1A Fuel Burners
- 1B Incinerators
- 1C Volatile Organics
- 1D Others
- 1E Ozone Depleting Chemicals
- 1F Particulates/Bead Blast
- 1G Air Toxics, Metals
- 1H General Requirements
- 1I Vehicle Emissions*

Hazardous Materials
- 2A Storage Structures
- 2B Operations/Management
- 2C Others
- 2D Flammables
- 2E Caustics/Corrosives
- 2F Compressed Gas Cylinders
- 2G Incompatibles
- 2H Hazard Communication
- 2I SARA Title III*

Hazardous Waste
- 3A Accumulation Points
- 3B TSD Facilities
- 3C Training
- 3D Waste Minimization
- 3E Others
- 3F Oil/Water Separators
- 3G Satellite Accumulation Points
- 3H Operational Procedures
- 3I Unauthorized Locations*

Natural/Cultural Resources
- 4A Wildlife/Recreation/Forestry
- 4B Cultural/Historic
- 4C Land/Agriculture
- 4D Wetlands/Floodplains
- 4E Others
- 4F Threatened/Endangered Species*

Noise
- 5A AICUZ
- 5B Procedures
- 5C Others
- 5D Management*

Pesticide
- 6A Facilities
- 6B Operational Procedures
- 6C Others
- 6D Equipment*
- 6E Materials & Storage*
- 6F Personnel Issues*

POL
- 7A Aboveground Tanks
- 7B Underground Tanks
- 7C Operations/Management
- 7D Others
- 7E Oil/Water Separators
- 7F Drum Storage
- 7G Hydrant Systems*
- 7H Loading/Unloading Racks*

Solid Waste
- 8A Landfills
- 8B Receptacles
- 8C Recycling
- 8D Others
- 8E Medical Waste
- 8F Regulated Materials

Special Programs
- 9A PCBs
- 9B Asbestos
- 9C Radon Mitigation
- 9D Others
- 9E IRP
- 9F EIAP
- 9G A-106
- 9H ECAMP
- 9I Lead-Based Paint
- 9J Low Level Radiation
- 9K Automation Issues or WIMS-ES

Water Quality
- 10A Sanitary Wastewater
- 10B Industrial Wastewater
- 10C Storm Water Runoff
- 10D Non-point Runoff
- 10E Operations
- 10F Others
- 10G Facilities/Equipment
- 10H Oil/Water Separators
- 10I Drinking Water

Pollution Prevention
- 11A Management Plans
- 11B ODCs
- 11C EPA 17
- 11D Hazardous Waste Minimization
- 11E Recycling
- 11F Affirmative Procurement
- 11G Energy Conservation
- 11H Education and Training
- 11I Hazardous Material Control
- 11J Others

TABLE 2. AFMC Violation Type Codes

Administrative		Potential Discharge		Discharge	
A1	Records	P1	Operational Practices	D1	Excess Chemical Parameter
A2	Labels	P2	Inadequate Facility	D2	Excess Physical Parameter
A3	Reports	P3	Inadequate Equipment/Container	D2	Excess Physical Parameter
A4	Manifests	P4	Others	D4	Spills/Leaks or Releases
A5	Lack of a Permit	P5	No Testing/Verification	D5	Others
A6	Inadequate/Missing Plan	P6	Containment	D6	Containment*
A7	State/Public Notification	P7	Property/Habitat Modification*	D7	Property/Habitat Destruction*
A8	Public Notification	P8	Biotic Contamination*	D8	Illegal Take*
A9	Fire Standard			D9	Erosion/Sedimentation*
A10	Program Planning			D10	Biotic Contamination*
A11	Sampling				
A12	Training				
A13	Other				
A14	Registration				
A15	Uncharacterized				
A16	Lacking or Incomplete Inventory/Survey				
A17	Sampling/Testing/Verification*				

MATERIALS & METHODS

A total of 1,558 environmental findings resulted from the second round of external ECAMP assessments at the fourteen Air Logistics and Systems Centers. Each finding resides in a database that includes all WIMS-ES fields. A printout of a finding's Descriptive Phrase, Finding Detail, and Finding Identification Codes by protocol and installation was generated for this analysis.

Each finding phrase and detail were read to validate coding and, where applicable, codes were updated on the printout and in the database. Categorized as Discharge, Potential Discharge, and Administrative, Violation Type Codes were used to initiate the analysis because they represent a hierarchy of concern. The worst-case situation is a Discharge that must be dealt with immediately. The next worst-case condition is a Potential Discharge that does not require immediate attention but is of sufficient concern to warrant management attention. The final VTC is Administrative, widely held as easily fixed, dealing with records and administrative procedures.

The data were reassembled into a matrix to identify "spikes," or areas of concern warranting further investigation. A three-step process of investigation, termed "peelback," was undertaken. The first step identified the number of findings, by ECAMP protocol, for each VTC category (Discharge, Potential Discharge, or Administrative). Step 2 grouped by protocol the FCCs with the highest occurrences. The final step ordered the number of findings with the highest occurrence within each VTC for the FCCs and provided the sequence of noncompliance trends.

RESULTS AND DISCUSSION

Of the 1,558 findings, 158 (10%) fall within the VTC Discharge category, 723 (46%) within Potential Discharge, and 677 (44%) within Administrative. What follows is a discussion of the trends found using the peelback procedure for protocols associated with the highest regulatory vulnerability.

Water Quality: Fourteen percent (218) of all findings were related to Water Quality and 36% of these findings resulted in a discharge to the environment. Thirty-nine percent of the Water Quality discharge findings are related to industrial discharge. The review of discharge-related findings reveals that wash racks contribute to the majority of Industrial Wastewater releases. Investigation of the wash rack finding details indicates the causes are associated with operational practices. The remaining findings for Industrial Wastewater deal with exceedances of chemical or physical parameters. Sanitary Wastewater discharges (19%) are primarily exceedances of chemical parameters specified in pre-treatment permits. Storm Water Runoff discharges (19%) are attributed to exceedances of physical parameters, including debris in watercourses or high total suspended solids readings and turbidity. The majority of discharge findings associated with Nonpoint Runoff (12%) identify soil erosion from both construction and nonconstruction sites.

There are no significant Potential Discharge or Administrative trends.

POL: Another 14% (219) of the total findings were identified in the petroleum, oils, and lubricants (POL) protocol. Only 16% of these findings are related to environmental discharges. Ninety-six percent of the findings are attributed to overfilling tanks or with faulty equipment associated with tank filling. Lack of containment or faulty fittings for fuel/lubricant dispensers are common. Even findings associated with worn equipment could be mitigated through proper operational procedures.

Fifty-seven percent of the POL findings were categorized as Potential Discharge situations. Nearly three-quarters of them require a technical fix such as equipment or facility repair: Containment (57), and Inadequate Equipment/Container (35). Common problem areas are impervious or missing dikes and berms, inoperative or missing detection systems or cathodic protection, and lack of POL pipeline/fill security. The technical requirements have been aggressively addressed in the AFMC environmental compliance funding process. It is anticipated that future ECAMP findings will show a decrease in POL findings due to technical inadequacies.

Administrative POL issues include the lack of site-specific spill response plans and incomplete underground storage tank records.

Hazardous Waste: For Hazardous Waste, 313 findings (20% of the total) were identified. Only 25 of the findings (8%) identify discharges to the environment. Fifty-six percent of the Hazardous Waste discharges are linked to Hazardous Waste accumulation points. The remaining

44 percent are identified as Operational Procedures. The majority of finding details are the same in both cases: leaking containers and spills resulting from poor management practices.

Fifty-eight percent (180) of the Hazardous Waste findings address Potential Discharges. Operational Practices and Inadequate Equipment/Container are cited most often. Sixty-eight percent of the Hazardous Waste Potential Discharge findings occurred at Initial and 90-Day Accumulation Sites while only 7% are attributed to treatment, storage, and disposal facilities.

Administrative Hazardous Waste issues deal with response and management plans, and incomplete labeling at accumulation areas. The overall trend identifies a need for more explicit training. The AFMC has recently initiated a Command-wide hazardous waste training initiative to bring individual unit responsibility into the hazardous waste management program.

Air Emissions: Eight percent (123) of the findings were in the Air Emissions protocol. Twenty-two identified actual emissions to the atmosphere. Findings for discharges of Volatile Organics (45%) are attributed to uncovered degreasers and leaking seals on bulk fuel tanks. With the conversion from JP-4 to JP-8 jet fuel, it is anticipated that findings for fuel tank seals will disappear in the third round of ECAMP evaluations. Ozone Depleting Chemical (18%) discharges include venting of CFCs from large refrigeration systems and exceeding freon permit limits. Findings for Fuel Burners (14%) primarily address exceedances of opacity limits. Operational practices and mitigation equipment problems shared equally as root causes for Air Emissions.

There are several Administrative issues which identify incomplete emission source surveys or records (particularly VOCs), permit opacity limit exceedances on fuel burners, and unpermitted VOC sources. Most common is the failure to document the volume of paint used and the associated volume of VOC content.

Hazardous Material: Nearly 20% of all findings (307) were identified in the Hazardous Material Management Protocol. Sixty-seven percent (207) of the findings were categorized as Potential Discharges due to improper storage of flammables, caustics, corrosives and compressed gas cylinders.

Thirty percent (93) of the findings were Administrative, primarily citing inadequate plans and procedures (49) and poor Hazard Communication program management (25).

Cross-functional management attention from Ground Safety, Fire Protection, and Bio-environmental Engineering can lead to a coordinated resolution of these Hazardous Material issues.

CONCLUSION

In conclusion, the five protocols discussed comprise 76% of all findings for AFMC's second round of external ECAMP evaluations. There are no findings that describe problems that are unresolvable in any of the protocols. Continued cross-functional cooperation within the Command should resolve the issues addressed.

The AFMC continues to use ECAMP data analysis to develop Command-wide initiatives to improve environmental compliance. As previously noted, AFMC has addressed facility and equipment deficiencies leading to noncompliance in POL areas. The number of findings due to operational practice is also receiving a high level of attention. The potential for regulatory intervention for Hazardous Waste findings with procedural root causes has focused management attention on developing and issuing standardized Command-wide operating procedures and training requirements for Hazardous Waste management.

This process of data analysis establishes an appropriate framework for application of AFMC resources to improve environmental compliance and management. Finding Category Codes are useful for investigating instances of environmental noncompliance and identifying their root causes. The AFMC process illustrates how spikes for the various protocols, FCCs, and subsequent VTCs are "peeled back" to reveal issues for management attention.