



ENVIRONMENTAL EVALUATION GROUP

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

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October 27, 2000

Dr. Inés R. Triay, Manager
Carlsbad Field Office
U. S. Department of Energy
P. O. Box 3090
Carlsbad, NM 88221-3090



Dear Dr. Triay:

Attached is the EEG observer report on the CAO's September 18-21, 2000, audit of RFETS homogeneous solids. Though a few concerns will delay shipment of homogeneous solids from RFETS, these can be remedied, and the RFETS waste characterization process as a whole appears to continue to improve.

Sincerely,

Matthew Silva
Director

BAW:ss
Enclosure





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COPY

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MEMORANDUM

DATE: October 9, 2000
TO: Matthew K. Silva, Director
FROM: Ben Walker, QA Specialist *Baw*
SUBJECT: CAO Audit of RFETS, September 18-22, 2000

I observed the CAO audit of RFETS Homogeneous Solid Waste the week of September 18-22, 2000. This unofficial audit title is something of a misnomer, as major portions of the audit related to repackaging of debris wastes, new NDA instrumentation, the hydrogen gas generation program, and an annual review of transportation activities. The audit was conducted by 17 CAO auditors; two EPA inspectors reviewed NDA activities; and seven NMED personnel and contractors also observed the audit. Attachment 2 is a list of the concerns raised during the audit, as presented at the closeout meeting.

While nearly all RFETS activities reviewed showed strong conformance with WIPP requirements there was one issue that will prevent certification of the RFETS homogeneous solids program for some time (see item 3 of Attachment 2). There is a WAP requirement that the site perform a complete confirmation and reconciliation of sampling and analysis data with the acceptable knowledge (AK) before approval of a new summary category group. Since the solid wastes (summary category group S3000) reviewed during this audit had only recently been repackaged, and headspace gas samples cannot be taken until 225 days after closure of the shipping container (to ensure that container contents have reached 90% of steady state concentration), the requirement cannot be met for some time yet. RFETS had apparently not been aware of this requirement for acceptance of a new summary category group prior to the audit.¹

¹ An additional complication is that the S3000 waste streams examined during this audit (salt and ash residues) would normally not undergo headspace gas analysis, as they meet the heat-treatment criteria of the recently approved Class 2 modification to the WIPP Hazardous Waste Facility Permit (HWFP) eliminating headspace gas sampling for heat-treated wastes.

Memo to Matthew Silva, Director

Page 2

October 9, 2000

Qualification of new NDA equipment also had problems. Four instruments were to be qualified, but only two were fully qualified during the audit. The single Corrective Action Report generated during the audit was for the failure of the mobile segmented gamma scanner (SGS) in meeting the quality assurance objectives specified in Appendix A of the WIPP Waste Acceptance Criteria; the failure was due to use of radiation sources that did not meet the nominal alpha Curie size for two of the three instrument ranges reported. A second NDA problem was that a skid tomographic gamma scanner (TGS) did not have evidence that drums could be counted properly--there were data for can counting, but none for drums. This TGS was accepted for the can counting, but not for counting of drums. Neither of these issues will require extensive time or resources to correct, and verification may not require another audit team visit to RFETS. Two other TGS instruments were also accepted for can counting, as was a Neutron Multiplicity Counter (NMC) for drum counting. The EPA apparently concurred with these determinations, and the TGS can counters and NMC will now be available for producing NDA measurements.

These are high-visibility problems, but in general WIPP activities at RFETS reviewed during this audit seemed to be in good shape. RFETS processes continue to show evidence of improvement -- the transportation operations in particular were described to me as "100% improved" over the already adequate system of a year ago. The major reorganization that took place at RFETS during the spring of this year does not appear to have adversely affected the RFETS WIPP program, and may have created a structure that will better facilitate processing of wastes for shipment to the WIPP.

There were, however, other concerns raised at the audit that indicate there are still areas in which refinements can be made. Some of these are addressed more fully in Attachment 1 to this memorandum, as are other circumstances surrounding this audit.

BAW:ss

Attachments

ATTACHMENT 1 TO SEPTEMBER 2000 RFETS SOLIDS AUDIT

Other Noteworthy Auditor Concerns

Though only one CAR was generated, there were other concerns raised that could have been more significant had the programs involved been more mature. For instance, an independent technical reviewer (ITR) of a residues data package did not initiate a non-conformance report after identifying a necessary activity that had not been performed (see item 7 of Attachment 2); the project office QA officer designated a checklist item for the correctness and completeness of data forms was marked "N/A", with an explanation that the requirement was not applicable for "repack data packages" (item 13). This was a single instance, and may have been a simple mistake in filling out the checklist, rather than a conceptual error; however, it apparently was not picked up by the site project officer in his subsequent review. A separate observation was written on deficiencies in the project level data reviews of both the site project QA officer and the site project officer (item 14), and two other concerns (16 and 17) relate to ITR incidents for two separate waste characterization areas. While reviews of data packages involve allocation of significant resources they are a necessary part of the waste characterization processes. RFETS should ensure that the quality of these reviews is not abased as the flow of data packages increases and personnel changes are made.

One ITR concern (item 17) was written because the NDA ITR did not perform an entirely effective review of segmented gamma scanner data for cans. In part this was due to the absence of a checklist of items for review. The concern was corrected during the audit for the SGS operations on cans that were in the scope of this audit. However, it seems likely that the same review process is utilized for drums that have been counted by SGS, and no provision was made to ensure that the independent reviews for drums were comprehensive.

Another NDA concern (item 10) was that the area of Building 371 used for TGS NDA equipment has an appreciable, and variable, radiation background due to storage of waste containers in the same room and a radioactive materials storage vault in the room beneath it. This background is at times high enough that the equipment cannot be used for assay work. While not a WIPP waste characterization concern, it was also noted that NDA operators working in this area were accumulating higher-than-usual doses. Apparently, plans are to put other NDA equipment in this area in the near future, despite counsel from radiation personnel. It would seem a better practice for RFETS to site NDA equipment in an area where background interference is not a problem.

Data Usability Criteria

One concern (item 15 on Attachment 2) is a problem for the CAO and WID rather than RFETS, at least in its initial stages. The WAP requires that (Section B3-1):

The comparability of waste characterization data shall be ensured through the use of generator/storage site data usability criteria. The Permittees shall ensure that

data usability criteria are consistently established and used by the generator/storage sites to assess the usability of analytical and testing data. CAO/WID have not yet promulgated data usability criteria for the generator sites to follow-- likely, at least in part, because of the difficulty in writing such criteria. Section B3-1 continues as follows:

The criteria shall address, as appropriate, the following:

- Definition or reference of criteria used to define and assign data qualifier flags based on Quality Assurance Objective results,
- Criteria for assessing the usability of data impacted by matrix interferences,
- Criteria for assessing the usability of data based upon positive and negative bias as indicated by quality control data, of data qualifiers, and qualifier flags,
- Criteria for assessing the usability of data due to
 - Severe matrix effects,
 - Misidentification of compounds,
 - Gross exceedance of holding times,
 - Failure to meet calibration or tune criteria
- Criteria for assessing the usability of data that does not meet minimum detection limit requirements.

The Permittees shall be responsible for evaluating generator/storage site data usability and shall assess implementation through the generator/storage site audit.

It is this last statement that led to the concern, which will be reported as an observation in the CAO audit report. Development of criteria to meet these goals should likely include input and review not only by qualified generator site personnel but also technical auditors responsible for performing evaluations during audits.

RFETS Shipments to WIPP

The RFETS has provided most of the waste disposed at the WIPP thus far, but (like all other sites) has not yet met the monthly shipment rates that have been projected. RFETS personnel indicated that shipments are slower than expected due to a variety of reasons. A primary problem appears to be that the WIPP project is diffused across many parts of the RFETS site. Failures to meet the authorization basis requirements in one area of the site will cause a weeks-long or months-long shutdown of the area, and the TRU waste containers or waste characterization equipment in that area cannot be used until the concerns are resolved. When that area again becomes operational other areas may be down. As safety concerns are constantly shifting during the dismantling process at RFETS it is easy for an USQ or another kind of lapse to create these occurrences.

Waste characterization itself does not seem to be causing the delays. The characterization process could apparently supply the containers needed to meet the shipping schedule were it not for the often non-WIPP program safety concerns, and RFETS continues to eliminate potential bottlenecks in its WIPP process. For example, the single TRUPACT-II loading facility currently in use had seemed during previous audits to be a possible bottleneck (see Walker-to-Neill memorandum "CAO/EPA RFETS Recertification Audit, March 1-5, 1999"); RFETS has initiated efforts to construct two more TRUPACT-II loading facilities. Another headspace gas sampling facility has been developed next to these proposed loading facilities--in a building under an authorization basis shutdown during the audit. This building (Building 440) has about 3900 drums and 1800 SWBs of mostly debris wastes in it, and Canberra's NDA facility is also close by. When operational restrictions at the building are lifted and the transportation facilities are completed the RFETS may very well be able to meet the 30+ shipments per month it is scheduled for beginning a year from now.

RFETS Continuous Bias Correction Program

As a part of the Safeguards program RFETS has a Continuous Bias Correction Program (CBCP) which establishes a correction factor for each NDA instrument used in can counting. This correction factor is a ratio of the average of 15 counts on the NDA instrument to the average count of the same can in a calorimeter, and is applied to all measurements performed by the instrument. Correction factors are established for each IDC counted on the instrument. After the correction factor has been established, it is checked through comparison of one randomly chosen container from each operating batch to a calorimetry count of the same can. For residue counting, the program is not optional--Safeguards will not release the residues for shipment to the WIPP unless the program is in effect.

RFETS made a special presentation to a CAO NDA technical auditor and an EPA NDA inspector on the program, which I attended. Neither expert seemed to find any problems with the use of the CBCP for WIPP measurements. While calorimetry has a well-established accuracy, the process is consistently accurate only for what are high Curie counts in WIPP waste. However, the cans are used only for residues, which also have the higher Curie content.

AK Accuracy Report and Repackaged Wastes

During evaluation of the AK process an auditor noted that the AK accuracy report did not include data from repackaged containers (of salt and ash residues), some of which were found to have different IDCs than what AK data had specified. As AK accuracy reports may be used in the future in support of reducing other characterization requirements the concern caught the attention of several persons at the audit. The concern was further complicated by the variety of storage methods at RFETS; salt and ash residues are in individual small cans (liter size), but the cans may be either individually stored or in 55-gallon drums.

RFETS personnel justified not including AK errors found during repackaging in the AK accuracy report by stating that a CAO auditor in the past had given direction that inconsistencies

in repackaged waste did not need to be tracked and reported. The RFETS objections were not necessarily that the concern was wrong, but that different auditors seemed to be providing different interpretations of the requirement. To resolve the RFETS problem a conference call was made to the earlier auditor, at his home office in Michigan; at RFETS the call participants included the audit team leader, the QA auditor for the AK portion of the audit, two technical auditors involved in raising of the concern, the CAO's QA Manager, NMED's lead observer and AK observer, three RFETS personnel (others listened through the open doorway), and myself.

It took some time to clarify the situation to the auditor in Michigan. Just as he seemed to begin to understand the nature of the concern he received a call on a second line from the CAO Assistant Manager for the National TRU Program (NTP). On hearing of the conference call the Assistant Manager for NTP requested that he be included in it, and he was patched in. Sometime later the Carlsbad Area Office Manager also entered the discussion, through the Assistant Manager for NTP's connection.

The addition of CAO upper management to the conference changed the complexion of the meeting considerably by focusing on issues beyond the original scope of the call. The CAO Assistant Manager for NTP argued that errors in AK should only be considered at the time of waste shipment, and repackaging eliminated consideration of any previous AK errors. The NMED AK expert pointed out that if this were the case then credit for thermal treatment of the waste included in the "old" AK should also not be allowed, and headspace gas sampling and analysis would be required. The CAO Manager's entrance to the meeting occurred as resolution of the initial concern was nearly completed, and led to repetition of many of the points of view that had previously been expressed. Several times RFETS personnel were asked to verify statements by the CAO audit personnel. The lead NMED observer eventually interrupted the debate to state that if the CAO wanted to submit an audit report using the CAO management interpretation then the NMED would evaluate the audit report at that time. He then left the room, which effectively ended the discussion.

CAO management's interest in the issue may be understandable, but in this case active involvement in the discussion raised questions about the independence of the audit process (as specifically noted by the NMED lead auditor during the audit closeout), resulted in delays to the auditing efforts, and created a confrontation with regulatory personnel that appeared both inappropriate and unnecessary. These unintended results were apparently due to a failure to adequately assess the suitability of the situation before initiating arguments that ultimately turned out to be counterproductive. Both the NMED and the EPA have expressed a strong interest in the independence of the audit process from line management interferences, and the perception at the audit was that CAO management had clearly overstepped this boundary.

The initial purpose of the call--to clarify for RFETS what AK deficiencies discovered during repackaging must be reported in an AK accuracy report--resulted in a decision that misidentification of individually-stored cans should be considered in the AK accuracy report; for cans stored inside 55-gallon drums, only when greater than 50% of the drum contents are misidentified would the misidentification be included in the report. RFETS re-analyzed

repackaging reports under these guidelines to determine when IDCs had been misidentified, and included of these misidentifications in AK accuracy reports. This re-analysis was completed during the audit, and it apparently changed the reported accuracy by only a very slight amount.

Residue Repackaging and WAP Repackaging Characterization Requirements

As a result of the CAO Assistant Manager for NTP's comments during the conference call (see previous item) I looked at the WAP requirements for repackaged wastes, to see if his interpretation of the repackaging requirements was justified. The results are disconcerting, in that if the RFETS pyrochemical salt and ash residues are considered to be repackaged then they need to undergo headspace gas sampling and analysis. Section B-3d of the HWFP states:

Repackaged waste shall undergo characterization required of newly generated waste. Repackaged waste shall also undergo headspace gas analysis, and payload container headspace shall be sampled after repackaging, as long as the criteria specified in Permit Attachment B1-1 are met. [Attachment B1-1 contains a requirement for container aging to reach a steady state within the payload container before headspace gas sampling is performed.]

My perception was that the thermal treatment Class 2 HWFP modification accepted by the NMED on August 8, 2000 was primarily intended to eliminate headspace gas requirements for these RFETS residues. If so, then alteration of this section of the WAP should obviously have been a part of that modification.

The WAP requirement seems designed for repackaging due to incomplete or unusable AK, which is not the case with RFETS residues. The repackaging is being performed to reduce the radionuclide content in individual containers, and the AK for residues is likely as good or better than for any of the retrievably stored wastes. Headspace gas sampling and analysis is a step virtually everyone agrees is unnecessary for the pyrochemical salt and ash residues, and the DOE should pursue a further modification of the HWFP to alleviate the requirement for these residues.

RFETS AUDIT A-00-12 September 18-22, 2000

No.	Who	Description of Concern	Concern	CAR	CDA	Obs	Rec.	Status
1	Coop/Ma y	Data contained in the report for demonstration of non-destructive assay quality assurance objectives for the mobile segmented gamma scanner, number D-6297, QAO-SGS-Mobile, Rev B, Dated 9/7/00 was obtained with sources of incorrect size for two of three ranges reported and no data or results were shown for a 4 th range.		X				
2	Blauvelt/ Calvert	No references on repackaged waste streams to the generating facility process flow diagrams			X			
3	Blauvelt/ Calvert	AK documentation for confirmation and reconcillation has not been completed for summary category group S3000.						This concern will be addressed during a future audit activity.
4	Blauvelt/ Calvert	Accuracy reports do not include information on repackaged waste.			X			
5	Gill/Davi s	Batch 71-00-11, drum 91196. The operator ran a CCV in accordance with procedure (PRO-962-MGSS-001, Appendix 3). The CCV failed to meet acceptance criteria and the operator ran a second CCV in accordance with Appendix 3 (step 24). The manual baseline adjustment for the second CCV was not performed in accordance with Appendix 11 (operator moved baseline to second valley rather than the first.) CCV meet criteria under these conditions. The deviation from procedure was not documented, and the CCV was recorded as meeting acceptance criteria without any notation or action regarding the deviation from procedure.			X			
6	Greenwo od/Schue tz	Cans that are opened and that do not match the waste stream being visually examined are closed and removed from the process line. An NCR is not initiated to show that the can does not match the AK for the waste stream.						Withdrawn use non-NCR process to identify these cans to AK.

RFETS AUDIT A-00-12 September 18-22, 2000

No.	Who	Description of Concern	Concern	CAR	CDA	Obs	Rec.	Status
7	Greenwood/Schuetz	The ITR identified an activity that was not performed, or performed correctly, and did not initiate an NCR.			X			
8	Gill/Davis	Section B1-1d requires annual calibration of temperature sensors. The temperature monitor on the refrigerator used to store standards is scheduled for calibration every two (2) years.			X			
9	Gill/Davis	Procedure PRO-1032-Headspace, section 5[7] requires that all equipment requiring calibration have a current calibration sticker. The gas-tight syringe, which can be used for calibration and/or QC purposes, is not calibrated.			X			
10	Bresson/Walsh	The TGS NDA equipment is located in Bldg. 371 in areas of relatively high and fluctuating radiation dose rates. (2-8 mrem/hr) The radiation levels are caused by movement of waste and residue containers in the room where some of the assay equipment is located, and plutonium stored in a vault below the room. Because of the radiation background, on a number of occasions, the NDA system background control limits have been exceeded, not because of instrument malfunctions, but due to ambient backgrounds, which impact the ability to assess instrument function.					X	
11	Fitzgerald/Ledford	The wet combustible process relies on the IDC for describing the waste items being visually verified. While the data reports reviewed during the audit contain a description that meets the HW permit requirements, there is a risk using the current procedure of not documenting an adequate waste description during wet combustible repackaging. For instance in batch data report CRR-DR-371-C-005 IDCs 330, 336, and 337 were repacked with absorbent. A note was added to the comments section stating that absorbent was used. Without this note, the waste description would not be complete because the IDCs would not identify that absorbent is present. RFETS needs to assure that the waste description is complete, which may include a combination of the IDC and supplementary comments. This would include a description of other IDCs constituting less than 10% of the waste matrix as allowed by the wet combustible repackaging procedures.				X		

RFETS AUDIT A-00-12 September 18-22, 2000

No.	Who	Description of Concern	Concern	CAR	CDA	Obs	Rec.	Status
12	Verret	Manual data entry is used to input analytical results into the software program that generates the field QC RPD and F-Test results. There is a potential for data entry errors which would then result in invalid RPD and F-Test results. The possibility of electronic transfer of analytical data to field QC should be investigated.					X	
13	Greenwood/Walsh	SQAO checklist item to confirm that data forms are complete and data has been reported correctly was marked N/A. The comment section has default explanation of "N/A for repack data packages."			X			
14	Greenwood/Walsh	<p>The project level data reviews (SQAO and SPM) are not fulfilling their intended purpose. Reviews and application of criteria are not consistent between packages.</p> <ol style="list-style-type: none"> 1. Determination of completeness QAO has been applied incorrectly and not consistently between packages. 2. Items documented as deficient are accepted for use without adequate explanation of how the determination that the data was usable was made. Example; approval for use of data with surrogate spikes out of limits. 3. The PM checklist is completed and signed based solely on checklist signatures. The PM does no independent review to determine if previous reviews were adequate. 4. The SQAO VOA checklist did not include a question regarding surrogates. 				X		
15	Greenwood/Walsh	CAO has not developed the data usability criteria to ensure that the assessment of data by generator sites is consistent. Subsequently RFETS does not have any established data usability criteria.				X		
16	Greenwood/Walsh	ITR checklists for metals/TCLP and VOAs should be more detailed. In addition, as the ITR checklists are completed (for all areas) the ITR should provide references to areas of the data package that supports data quality determinations made by the ITR.				X		
17	Coop/Ma y	The Independent Technical review of the SGS data packages does not ensure that the review is effective. No checklist or signoff sheet is used for the individual assays. No record of the reviewers actions are kept. When we observed one of the ITR's review an assay report, he failed to check several important items.			X			

RFETS AUDIT A-00-12 September 18-22, 2000

No.	Who	Description of Concern	Concern	CAR	CDA	Obs	Rec.	Status
18	Coop/Ma y	Recommend that background-check measurements be performed at least weekly on the TRIFID instruments used in conjunction with the NMC neutron instruments.					X	
19	Coop/Ma y	During the review of data packages 707-NM1-OR-052300 and 707-NM2-OR-052900 it was determined that the radioassay data report failed to report "QC replicate (yes/no) as required by the WAC.			X			
20	Coop/Ma y	SGS Batch Data Reports indicated two types of TMU values that were incorrect: 1) Hand prepared radioassay data sheets, that are used when AK default isotopics are used in the assay calculations, show a TMU that is too large. 2) Total alpha activity TMU is too small. Neither of these values is used in subsequent calculations or is reported to WIPP in the WWIS system.				X		
21	Bresson/ Walsh	<p>Documentation for NDA activities (TGS Can Counters) is poorly organized to the extent that it would be impossible to answer questions regarding what NDA personnel did or did not do without someone explaining how 2 or 3 separate records relate to each other. All actions, practices, etc. by personnel were in compliance, the issue was the their documentation of their actions.</p> <p>An example was whether a specific criterion was met. To answer the question required 2 separate records and an explanation from NDA personnel. The answer was satisfactory but without the explanation we would not have been able to answer the question.</p>				X		
Totals				1	9	6	3	

Documents	Concern Classification				QA Evaluation		Technical
	CARs	CDAs	Obs	Rec	Adequacy	Implementation	Effectiveness
Activity							
NONCONFORMANCE					A	S	E
TRAINING					A	S	E
DOCUMENT CONTROL AND RECORDS					A	S	E
M&TE					A	S	E
SOFTWARE					A	S	E
ORGANIZATION/GRADING					A	S	E
ACCEPTABLE KNOWLEDGE		24			A	I	I
HEADSPACE GAS					A	I	I
GAS GEN TEST PROGRAM		5			A	S	E
VOC/SVOC					A	S	E
METALS					A	S	E
TGS CANS					A	S	E
TGS SKID CANS					A	S	E
SGS	1				A	S	U
NMC					A	S	E
REPACK SALTS					A	S	E
REPACK ASH/WET/DRY					A	S	E
TRANSPORTATION					A	S	E
WSPF					A	I	I
VERIFICATION AND VALIDATION					A	M	M
WWIS					A	S	E
SWB					A	S	E
TGS SKID DRUM					I	I	I
TOTALS					A/A	S/I	E/I

Definitions

E = Effective

S = Satisfactory

I = Indeterminate

M=Marginal

CAR = Corrective Action Report

CDA = Corrected During Audit

NE = Not Effective

Obs = Observation

Rec = Recommendation

A = Adequate

NA = Not Adequate