



Department of Energy

Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831—

July 28, 2006

Mr. Brian W. Smith
Office of Nuclear Material
Safety and Safeguards
U.S. Nuclear Regulatory Commission
Two White Flint North
MS 8F42
Rockville, MD 20852

Dear Mr. Smith:

USEC INC. – CENTRIFUGE LEAD CASCADE – DEPARTMENT OF ENERGY (DOE) REGULATORY OVERSIGHT ITEMS

The purpose of this letter is to provide the enclosed information regarding the DOE regulatory oversight of the USEC Inc. Centrifuge Lead Cascade (CLC) activities at Piketon, Ohio. As discussed in our meeting on July 19, 2006, these items are currently open and may possibly be open at the time of USEC Inc. CLC regulatory oversight transition from DOE to the Nuclear Regulatory Commission (NRC). A brief description has been provided for each item; however, DOE is prepared to provide further information if needed.

If there are any questions or comments on this information, please contact me at (865) 241-8277.

Sincerely,

A handwritten signature in black ink, reading "Randall M. DeVault".

Randall M. DeVault
Regulatory Oversight Manager
Regulatory Management Team
Office of Assistant Manager
for Nuclear Fuel Supply

Enclosures

cc w/enclosures:
L. Gunter, NE-60
L. Clark, NS-50
J.T. Howell, NS-50
M. Heiskell, NS-51
A. Takacs, NS-52
K. Walling, CC-10
S. Toelle, USEC
P. Miner, USEC Inc.

Enclosure 1
DOE
Centrifuge Lead Cascade (CLC)
Regulatory Oversight Transition Items

Open Items

The following is a summary of the DOE Open Items from previous DOE ROA inspection reports that are expected to be open at the time of transition of the Lead Cascade regulatory oversight to NRC:

1. USEC Inc. uses an impact collector for high volume air sampling. USEC Inc. procedure AC2-RG-021 discusses using a collection efficiency of 50 percent when using the impact collector. The technical basis document for the air monitoring program states that a study was conducted in 1995 which evaluated the collection efficiency of the impact collector. USEC Inc. has been unable to locate this study. The adequacy of the 1995 study of the collection efficiency of the impact collector is being tracked as **Inspection Follow-up Item (IFI) 70-7003-2005-10-01.**
2. During DOE's review in June 2006, of the information provided by USEC Inc., additional discrepancies with the X-3001 Train 7 & 8 indoor fencing, the X-7725/7726 outdoor fencing, and the X-3001 Emergency Action Plan were identified while conducting plant area walkdowns. USEC Inc. Condition Notification #528 was issued by USEC Inc. to resolve. The resolution of this issue is being tracked as **IFI 70-7003-05-11-01.**
3. The Auxiliary Operator Training Requirements Matrix (TRM) indicated "PAST DUE" on Physical Testing Module X04690. The USEC Inc. Training Requirements Limitations Matrix (TPP-2603-0003, May 2006 Rev. 1) restricts work for personnel not having this training from performing any work requiring a physical (entry into noise areas). The Auxiliary Operator had entered areas in X-3001 requiring hearing protection. The resolution of this issue is being tracked as **IFI 70-7003-2006-05-01.**
4. An item related to inadequate perimeter lighting will be tracked as **05SEP09-OR-11560-SSIS-PPO.2-002.**
5. An item related to the final approval of a Security Plan will be tracked as **05SEP09-OR-11560-SSIS-PM.2-001.**

Text removed under 10 CFR Part 810

Enclosure 2



August 12, 2005
DOE 05-0007

Mr. Randall M. DeVault
Regulatory Oversight Manager
Office of Assistant Manager for Nuclear Fuel Supply
U.S. Department of Energy
P.O. Box 2001
Oak Ridge, Tennessee 37831-8651

**Portsmouth Gaseous Diffusion Plant
American Centrifuge Engineering and Manufacturing Project
Lead Cascade Demonstration Facility
Corporate Review Requested in Centrifuge Hoisting and Rigging Activities Letter**

Dear Mr. DeVault:

The subject letter (Reference 1) requested a corporate review of the Department of Energy (DOE) regulated hoisting and rigging activities for the centrifuge deployment projects at Piketon, Ohio, and Oak Ridge, Tennessee, and the submission to DOE of a plan and schedule for this review. USEC submitted the plan and schedule for this review to DOE in a USEC letter (Reference 2) dated April 25, 2005, from Steven A. Toelle to Randall M. DeVault.

The corporate review of the DOE regulated hoisting and rigging activities was performed by USEC's respective Quality Assurance organizations at the Gaseous Centrifuge Enrichment Plant Cleanup Project and the Lead Cascade Demonstration Facility in Piketon, Ohio, and the American Centrifuge Engineering and Manufacturing Project in Oak Ridge, Tennessee. Details of these reviews are contained in the assessment reports previously provided to you and the DOE Site Safety Representatives at each of these sites. These reviews provide us the opportunity to strengthen our programs. The deficiencies and/or recommendations identified in these assessment reports will be tracked in the respective site's corrective action system.

There are no new commitments in this letter. If you have any questions regarding this review, please contact me at (301) 564-3250.

Sincerely,

Steven A. Toelle
Director, Nuclear Regulatory Affairs

USEC Inc.
6903 Rockledge Drive, Bethesda, MD 20817-1818
Telephone 301-564-3200 Fax 301-564-3201 <http://www.usec.com>

231202

Mr. Randall M. DeVault
August 12, 2005
DOE 05-0007, Page 2

References:

1. DOE Letter dated March 25, 2005, from Randall M. DeVault to Steven A. Toelle
2. USEC Letter dated April 25, 2005, from Steven A. Toelle to Randall M. DeVault

cc: T. Takacs, DOE Site Safety Representative – Piketon
G. Herron, DOE Site Safety Representative – Oak Ridge
D. Hartland, NRC Fuel Facility Inspector – Region II
D. Martin, NRC Project Manager, PGDP
D. Seymour, NRC Fuel Facility Inspector – Region II

Sensue, Terry

From: Miner, Pete
Sent: Thursday, August 04, 2005 11:47 AM
To: Sensue, Terry
Subject: Fw: Hoisting and Rigging assessment of Lead Cascade Activities

Sent from my BlackBerry Wireless Handheld

-----Original Message-----

From: Smith, George W <smithgw@Ports.USEC.com>
To: Miner, Pete <MinerP@usec.com>
CC: Couser, Dave I <couserdi@Ports.USEC.com>; Rogers, Dan <rogersd@usec.com>
Sent: Thu Aug 04 11:38:47 2005
Subject: Hoisting and Rigging assessment of Lead Cascade Activities



**hoisting
ging asses**



Memorandum

To: Peter J. Miner
From: George W. Smith
Date: August 3, 2005
Subject: Assessment Report for Lead Cascade Hoisting and Rigging Activities

An assessment of Lead Cascade hoisting and rigging activities was performed from May through July 2005. This assessment was completed in accordance with the Lead Cascade Assessment procedure AC2-QM-001.

The scope of this assessment included interviews, document reviews and observations of hoisting and rigging activities.

During this period, lifting activities were limited to hoisting and rigging activities performed by contractors involved with construction activities. Two lifts, other than normal construction activities were completed. These lifts involved the removal of three large components used to test centrifuge components, and the installation of a transformer that is part of the Lead Cascade power distribution equipment. No deficiencies were identified during the assessment.

The report of the Management Assessment is attached.

GWS
Attachment (As Stated)

Cc/att: Dan Rogers
Dave Couser

Background:

In May 2005, USEC Inc. committed to completing an assessment Lead Cascade hoisting and rigging activities. The scope of this assessment included interviews, document reviews and observations of activities associated with Lead Cascade hoisting and rigging activities.

Attributes assessed during available hoisting and rigging activities, included:

- Availability of, and adequacy of, hoisting and rigging procedures.
- Assessment of the adequacy of equipment (including fixtures, slings, etc.) availability, testing, and maintenance.
- Verification of training and qualifications of hoisting and rigging personnel.
- Observations of hoisting and rigging activities.
- Verification of compliance with hoisting and rigging procedures.

During this period, the Lead Cascade project was under construction, so lifting activities were limited to hoisting and rigging activities performed by contractors involved with construction activities. No AT lifting activities involving centrifuge components took place during this period. No AT procedures for lifting and rigging activities have been implemented.

As part of this assessment, two heavy lifts, that were other than light load lifts involved with normal construction activities were completed. These heavy lifts involved the removal of three large components used to test centrifuge components, and the installation of a transformer that is part of the Lead Cascade power distribution equipment.

Assessment Results:**1. Availability of, and adequacy of, hoisting and rigging procedures.**

The only lifts available to observe during this period were lifts completed by contractors completing work tasks in support of the Lead Cascade. The specific activities available to observe were the removal of three large components used to test centrifuge components, and the installation of a transformer that is part of the Lead Cascade power distribution equipment. The Lifting and Rigging activities associated with these two lifts were completed in accordance with Engineered Lift Plans that were approved by AT Engineering. Accordingly there were no procedures required in support of these lifts.

The Engineered Lift Plans contained instructions required to make the lift; identified specific components to be used during the lift; identified applicable safety and health requirements; provided documentation for the completed inspection and load tests for the equipment; and provided for recording completion of tasks involved with making the lifts, such as completion of pre-lift inspections, completion of safety briefings, and records information pertaining to specific components used to make the lift.

2. Assessment of the adequacy of equipment (including fixtures, slings, etc.) availability, testing, and maintenance.

The equipment selected to make the specific lifts observed as reviewed and approved by AT Engineering. The Engineered Lift Plans provided a listing of specific equipment to be used to make the lift, as well as inspection and load testing data for each of the components used to make the lifts.

An initial review of test data for lifting equipment listed to for removal of the components used to test centrifuge components showed that the weight of the upending fixture that was to be installed on the components was not figured into the overall weight of the fixtures and component being lifted. The failure to include all items being lifted resulted in an initial load test being performed at a lower weight than required by the Engineered Lift Plan. Condition Notification 91 was issued, and the equipment was load tested at the correct weight.

3. Verification of training and qualifications of hoisting and rigging personnel.

The Engineered Lift Plan did not identify any training and qualification requirements for the contractor hoisting and rigging personnel, involved with making the lifts

4. Observations of hoisting and rigging activities.

The two lifts available during this period, involving the centrifuge testing components and the power transformer were observed from the start of the lift until the lift was completed. No violations of the approved Engineered Lift Plan were observed.

5. Verification of compliance with hoisting and rigging procedures.

As addressed in item 1 above, there were no procedures applicable to the two lifts made during this period. Compliance with the approved Engineered Lift Plans was verified during the observation of activities associated with the two lifts.

Enclosure 3



May 31, 2006
AET 06-0072

Mr. Randall M. DeVault
Regulatory Oversight Manager
U.S. Department of Energy
Oak Ridge Office
P.O. Box 2001
Oak Ridge, TN 37831-8651

Centrifuge Lead Cascade Project (CLCP)
Docket Number 70-7003
Reply to Notice of Violation (NOV) - Inspection Report (IR) No. 70-7003/2005-12

Dear Mr. DeVault:

The subject Inspection Report requested United States Enrichment Corporation (USEC) and USEC Inc. to attend a management conference at DOE offices in Oak Ridge, Tennessee on May 3, 2006. The purpose of the conference was to discuss the apparent violation from the inspection report as well as the past hoisting and rigging problems to provide the opportunity for USEC and USEC Inc., to present the cause and safety significance of the problems, and to describe the corrective actions taken.

The information discussed by USEC and USEC Inc. management at the conference is provided in Enclosure 1. During the conference the DOE requested additional information from USEC Inc. The responses to this request and supporting documentation are provided in Enclosures 2 and 3.

If you have any questions regarding this submittal, please contact Dave Couser at (740) 897-2218.

Sincerely,

Steven A. Toelle
Director, Nuclear Regulatory Affairs

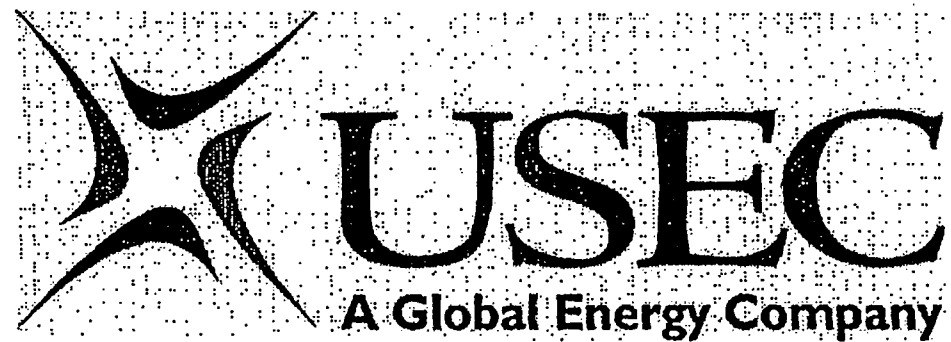
Enclosures: As stated

cc: T. Takacs, DOE Site Safety Representative - Piketon
D. Hartland, NRC Sr. Fuel Facility Inspector - Region II

USEC Inc.
6903 Rockledge Drive, Bethesda, MD 20817-1818
Telephone 301-564-3200 Fax 301-564-3201 <http://www.usec.com>

Enclosure 1 of AET 06-0072

**USEC and USEC Inc Management
Presentation**



DOE – USEC/USEC INC.

MANAGEMENT CONFERENCE

MAY 3, 2006

AGENDA

Introductory Remarks

Russ Starkey

Initial DOE Hoisting & Rigging Issues

Larry Cutlip

Corporate Hoisting & Rigging Evaluation

Larry Cutlip & Dan Rogers

Current DOE Hoisting & Rigging Issues

Larry Cutlip & Dan Rogers

Concluding Remarks

Vic Lopiano

Initial DOE Hoisting and Rigging Concerns

GCEP Cleanup (USEC) Concerns

Issues Identified by the DOE Prior to the USEC/USEC Inc. Hoisting & Rigging Evaluation

Four items were identified in DOE Inspection Reports prior to DOE's request that USEC perform an internal evaluation of its hoisting and rigging program. These are:

- While lifting a centrifuge from a transport cart, the top of the centrifuge caught a clamping arm, in turn causing a pad mount bolt to shear.
- Centrifuge was lifted while in an incorrect orientation
- Individual observed walking under bridge of operating crane without appropriate PPE
- OJT crane training frequency listed as 60 months while classroom training frequency for similar crane was 36 months

Initial DOE Hoisting and Rigging Concerns

GCEP Cleanup (USEC) Concerns (Cont.)

Causal Factors:

Equipment failure, inattention to detail

Corrective Actions Taken:

- Hydraulic clamp repaired and procedures were enhanced to correct centrifuge lift issues
- Discussed with involved individuals, provided safety related briefings on head & eye protection requirements while working under or around overhead cranes, and
- Applicable personnel were verified to have current GDP training or were trained to initial Hoisting & Rigging classroom requirements; the 36 month retrain frequency was determined not to apply to GCEP Cleanup personnel and; the 60 month OJT re-qualification frequency was retained to reflect an OSHA requirement.

Corporate Hoisting & Rigging Evaluation

USEC Hoisting & Rigging Review Results

USEC performed the requested hoisting and rigging evaluation and identified five concerns; these are:

- Annual or periodic inspections of single leg slings (chokers) are not being performed as required per applicable codes and standards (initial inspection performed by Code Inspection, pre-use inspections performed thereafter)
- Legacy procedures in use that do not require periodic reviews
- Procedure permits Operator revision of QC Inspection tags on UF6 handling cranes or lifting fixtures if tag is missing, illegible, or expiration date is in conflict with the Computerized Maintenance Management System (CMMS)
- GCEP Cleanup personnel's TRM did not reflect required training (Qualification Card completion)
- GCEP Cleanup personnel's TRM did not reflect the required 36 month retraining frequency for Hoisting & Rigging activities

Other:

- CMMS reliability improvements identified when scheduling preventive maintenance tasks, inspections, surveillances, etc.

Corporate Hoisting & Rigging Evaluation

USEC Hoisting & Rigging Review Results (Continued)

Causal Factors:

Management systems, Attention to detail

Corrective Actions:

- Immediate notification made to all shifts to consider chokers as slings and inspect per applicable procedure; all chokers inspected and scheduled for annual inspections.
- All subject procedures identified, reviewed, revised, or placed on hold
- Procedure revised to resolve inspection tag discrepancies or place crane out of service
- All GCEP personnel qualifications (Qualification Cards and Hoisting & Rigging) verified to be current, TRMs updated and verified.

Other:

- Additional training added to FLM/Planner qualification card; additional oversight provided for CMMS PM/surveillance data entry, self-assessment program revised to include more specific CMMS surveillances.

Corporate Hoisting & Rigging Evaluation

American Centrifuge Project (USEC Inc) Hoisting & Rigging Review Results

USEC Inc. performed the requested hoisting and rigging evaluation and identified one concern:

- Initial load test performed at a weight lower than required by engineering lift plan

Corrective Action:

- The load test was re-performed at the weight specified in the lift plan. This included taking into account the added weight of the load cell being used during the lift.

Current DOE Hoisting & Rigging Issues

Post USEC Hoisting & Rigging Review Concerns

Three Hoisting & Rigging Inspections have occurred since the internal hoisting & rigging review was performed; these are documented in Inspection Reports issued in November 2005, December 2005, and March 2006. One NOV and two IFIs were cited in the November and March Inspection Reports, respectively; there were no findings from the December Inspection Report.

Notice of Violation, six issues identified:

- Lifting fixtures out of code compliance
- Electric chain hoist used while out of inspection
- A Frame used while out of inspection
- Inspection tag labeled with month/year instead of month/day/year
- Lifting fixture missing inspection tag
- Colored plastic ties not attached to hoists indicating annual inspection acceptance

Current DOE Hoisting & Rigging Issues

Post USEC Hoisting & Rigging Review Concerns (Cont.)

Causal Factors:

Inadequate or incorrect procedures

Corrective Actions:

- Engineering reviews of the chain hoist and the A-Frame were performed. These reviews indicated that both pieces of equipment were acceptable for use and that there were no safety concerns.
- The first four items were related to inspection tags dated with only the month & year. The procedure was revised to specify the use of month/day/year and to replace the existing inspection tag.
- Item 5 – Lifting fixture re-inspected and tagged.
- Item 6 – Procedure revised to reflect current usage of metal equipment ID tags and current inspection tags.

Current DOE Hoisting & Rigging Issues

Post USEC Hoisting & Rigging Review Concerns (Cont.)

Two IFIs identified the following issues:

- Draft lift plan identified 5 lift points when two points commonly carry most of load
- Eyebolts being used for hoisting and rigging PCM-2 without adequate evaluation to assure proper reductions applied for non-vertical lifts

Corrective Action:

- Lift plan revised and a procedure to address lift plan development is being drafted
- Removed eyebolts, walked down facility for similar concerns, reviewed history of lifts without evidence of PCM-2 being lifted by eye-bolts. Although eyebolts are typically used as tie-down points, new lifting components were ordered, personnel briefed, and lift plan developed for crane lifts as required.
- Additional emphasis placed on hoisting & rigging issues in Self-assessments and MBWA reviews.

Current DOE Hoisting & Rigging Issues

Post USEC Inc Hoisting & Rigging Review Concerns

Three Hoisting & Rigging Inspections have occurred since the internal hoisting & rigging review was performed; these are documented in November 2005, December 2005, and March 2006 Inspection Reports. The summation of these inspections is that three NOVs and three IFIs were identified.

Causal Factors:

Our review of the causes of these issues revealed that in some cases, procedures needed improvement and that management enforcement of procedure usage needed improvement.

Notice of Violation issued, one example cited:

- Subcontractor utilized a "C" clamp to perform a lift

Corrective Actions:

- Contractors briefed, Engineering procedure revised to incorporate use of lift plans.

Current DOE Hoisting & Rigging Issues

Post USEC Inc Hoisting & Rigging Review Concerns (Cont.)

Notice of Violation issued, four examples cited:

- Floor hoist to be used without proper certification
- Sling identified that had not been inspected annually per procedure
- Personnel not trained to AC2-RG-027, "Hoisting and Rigging", effective October 14, 2005; lift made on October 17 without following procedure
- Incorrect form used to document jib crane inspection

Corrective Actions:

- All slings, hoists, and other lifting and handling equipment were taken out of service until proper inspections were performed.
- AC2-RG-027, "Hoisting and Rigging" was placed on hold. It was subsequently revised as an Engineering procedure and implemented after appropriate training.
- Employees were briefed on procedure usage and attention to detail.

Current DOE Hoisting & Rigging Issues

Post USEC Inc Hoisting & Rigging Review Concerns (Cont.)

Notice of Violation issued, three examples cited:

- Lift plans did not contain adequate detail to address potential lift hazards
- Use of forklifts and attachments not properly evaluated
- Jib crane had structural modifications without proper certifications

Corrective Actions:

- Lift plan development procedure was revised
- Forklift attachments were tagged out of service until the evaluation was completed.
- Jib Crane was tagged out of service.

Current DOE Hoisting & Rigging Issues

Post USEC Inc Hoisting & Rigging Review Concerns (Cont.)

Three IFIs identified:

- Monorail with 4 mounted ½ ton hoists was not labeled with monorail capacity to ensure rail capacity is not exceeded
- Inconsistent use of “Caution” and “Danger” tags
- Inadequate closure documentation for Condition Notification identifying the use of a non-approved lifting clamp for a sub-contractor activity

Corrective Actions:

- Unused hoists were tagged out of service
- Reviewed usage of tags for consistent application
- Collected appropriate documentation

Enclosure 2 of AET 06-0072
Requests for Additional Information
Provided during the Management Conference

Enclosure 2 of AET 06-0072

1. The DOE requested that USEC Inc. determine the recent operating history of the X-7726 assembly stand jib crane (V-2084). Specifically, whether the crane had been restored to service or used to make lifts in the presence of a degraded condition.

USEC Inc. Response:

USEC Inc. management reviewed the history of the crane and confirmed that it had not been restored to service for our use. In addition, personnel confirmed that the crane had not been used to lift any loads. An engineering evaluation of this crane determined that a replacement would be warranted. It has since been removed and a replacement installed. The installation and results of the required load test have been reviewed by the resident DOE site safety representative.

2. The DOE requested that USEC Inc provide additional information related to the Rotor Balance Stand lift plan and subsequent lift. Since this was an angle lift, the issue is whether the appropriate lift capacity reduction factor was applied in the calculation of the safe working load of the eye bolts.

USEC Inc. Response:

The Engineering Evaluation is provided in Enclosure 3. It concluded that the eye bolts used in the Rotor Balance Stand Lift were satisfactory and had the appropriate factor of safety.

Enclosure 3 of AET 06-0072
Requests for Additional Information
Provided during the Management Conference

Engineering Evaluation Coversheet

AC-86 (8/6/04)

EE #: EE-2601-0002, rev. 0		RES or Condition Notice #:	
Type: Engineering Evaluation		Evaluation Duration: Continuous	
Title: Response to DOE Inquiry on the Eye Bolt Capacity used in Rotor Balance Stand Lift			
Eval Doc Link: refer to EDMS			
Applicability/Description Statement:			
See Attachment			
Operability/Reportability Determinations Operable? <input type="checkbox"/> Yes <input type="checkbox"/> No Potentially Reportable Under 10CFR21 <input type="checkbox"/> Yes <input type="checkbox"/> No		Nonconforming Item Disposition – Check All That Apply <input type="checkbox"/> Use-As-Is <input type="checkbox"/> Reject <input type="checkbox"/> Upgrade <input type="checkbox"/> Repair <input type="checkbox"/> Return <input type="checkbox"/> Documentation <input type="checkbox"/> Rework <input type="checkbox"/> Acceptable-As-Is	
Implementation Actions Required? <input type="checkbox"/> Yes <input type="checkbox"/> No EIA #: FCE #: FCE Hyperlink: <small>Note: If implementing actions are required, an EIA number is also required to assure such actions are completed and do not violate AC License Application requirements and authorizations.</small>		Date Approved: Expiration Date: Changes to Design Docs Needed? <input type="checkbox"/> Yes <input type="checkbox"/> No Affected Docs:	
Other Comments or Notes:			
Approvals: Author: <u>John Hortel</u> <i>John Hortel</i> Date: <u>5/15/06</u> Reviewer: <u>Mark Saltzman</u> <i>Mark Saltzman</i> Date: <u>5/15/06</u> Approver: <u>Don Weber</u> <i>Don Weber</i> Date: <u>5/16/06</u>			

ATTACHMENT

Response to DOE inquiry on the Eye Bolt Capacity used in Rotor Balance Lift

EE-2601-0002, Rev 0

Page 2 of 4

Background: In June 2005, USEC Inc approved a vendor lift plan that was used in dismantling the Rotor Balance Stand in the X-7725 facility (reference DKM transmittal No. 10, Vendor Contract Number 677642, dated 6/05/07). The actual lift was made later that summer.

In December 2005 this same lift plan was reviewed by DOE as part of a hoisting in rigging audit. DOE's finding at that time (reference DOE Exit Meeting Minutes, Special Hoisting and Rigging Inspection, IR 70-7003-2005-011, dated December 8, 2005) was that the appropriate reduction factor was not taken for angled loading on the eye bolt.

Discussion: The lift plan was revisited and the following is known:

- The item in question is a 1 1/2-inch G-277 Shoulder Nut Eye Bolt manufactured by the Crosby Group Inc.
- The rated capacity (with a 5:1 factor of safety) for a vertical lift is 24,000 pounds.
- For angled lifts, only two values were included in the Crosby Catalog that was part of the attachment to the lift plan: 70% reduction of rated value for a 45-degree pull, and 75% reduction of the rated load for a 90-degree pull.
- The actual lift angle on the eye bolt was 7-degrees.
- The calculated vertical load supported by each of the four eye bolts was 10,306 pounds with a corresponding calculated horizontal load of 1,236 pounds.

As part of the review of the lift plan, it was recognized that the horizontal pull on the eye bolt and associated bending was relatively small compared to the 45 and 90-degree angled lifts. It was rationalized that the reduction of capacity of the eye bolt was in the 0 to 10% range.

Since only the 45 and 90-degree values were given in the data in the lift plan, another very conservative approach was to take a 70% reduction on the eye bolt capacity. The allowable load on the eye bolt is then reduced to 7,200 pounds. The lift with this assumption has less than the required factor of safety.

As part of this EE, a review was made of other available data from the Crosby Group Inc to determine the eye bolt capacity for angles between vertical and 45-degrees. The Crosby User's Guide provides a value of 15,600 pounds (35% reduction) for a 30-degree angled lift (see pages 3 and 4 of this EE).

This trend of a higher allowable eye bolt capacity with a smaller angle supports the original DKM Lift Plan assumption. Even applying a 35% reduction in capacity finds the eye bolt within an acceptable range.

Using the allowable load limits for a 30-degree sling angle and only relying on 3 eye bolts, the total eyebolt capacity of 46,800 pounds is greater than the actual calculated lifted load of 41,224 pounds.

Conclusion: The eye bolts used in the Rotor Balance Stand lift were satisfactory and had the appropriate 5:1 factor of safety.

ATTACHMENT


Response to DOE inquiry on the Eye Bolt Capacity used in
Rotor Balance Lift

EE-2601-0002, Rev 0
Page 3 of 4

Crosby USER'S GUIDE LIFTING

1

ASME VERSION (10/04)

RISK MANAGEMENT	TERMINOLOGY	FOR ADDITIONAL SUPPORT
DEFINITION	WORKING LOAD LIMIT (WLL)	
COMPREHENSIVE SET OF ACTIONS THAT REDUCES THE RISK OF A PROBLEM, A FAILURE, AN ACCIDENT	THE MAXIMUM MASS OR FORCE WHICH THE PRODUCT IS AUTHORIZED TO SUPPORT IN A PARTICULAR SERVICE.	 P.O. Box 3128 Tulsa Oklahoma 74101 Phone: (918) 834-4611 Fax: (918) 832-0940 1-800-777-1555 Web: www.thecrosbygroup.com E-Mail: crosbygroup@thecrosbygroup.com BLOCKS & FITTINGS FOR WIRE ROPE & CHAIN CROSBY® FITTINGS LEBUS® McKISSICK® WESTERN NATIONAL
ASME B30.9 REQUIRES THAT SLING USERS SHALL BE TRAINED IN THE SELECTION, INSPECTION, CAUTIONS TO PERSONNEL, EFFECTS OF ENVIRONMENT, AND RIGGING PRACTICES. SLING IDENTIFICATION IS REQUIRED ON ALL TYPES OF SLINGS ASME B30.26 REQUIRES THAT RIGGING HARDWARE USERS SHALL BE TRAINED IN THE SELECTION, INSPECTION, CAUTIONS TO PERSONNEL, EFFECTS OF ENVIRONMENT, AND RIGGING PRACTICES. ALL RIGGING HARDWARE TO BE IDENTIFIED BY MANUFACTURER WITH NAME OF TRADEMARK OR MANUFACTURER. REFER TO THE CROSBY GROUP CATALOG AND OTHER PRODUCT APPLICATION INFORMATION.	PROOF TEST	
	A TEST APPLIED TO A PRODUCT SOLELY TO DETERMINE INJURIOUS MATERIAL OR MANUFACTURING DEFECTS.	
	ULTIMATE STRENGTH	
	THE AVERAGE LOAD OR FORCE AT WHICH THE PRODUCT FAILS OR NO LONGER SUPPORTS THE LOAD.	
	DESIGN FACTOR	
	AN INDUSTRIAL TERM DENOTING A PRODUCT'S THEORETICAL RESERVE CAPABILITY; USUALLY COMPUTED BY DIVIDING THE CATALOG ULTIMATE LOAD BY THE WORKING LOAD LIMIT. GENERALLY EXPRESSED AS A RATIO, e.g. 5 TO 1. 