U.S. Department of Energy

Office of Inspector General

Office of Audits and Inspections

AUDIT REPORT

Kansas City Plant's Vendor Quality Assurance

OAS-L-14-08

May 2014

Department of Energy
Washington, DC 20585

May 21, 2014

MEMORANDUM FOR THE MANAGER, KANSAS CITY FIELD OFFICE

FROM: David Sedillo, Director
Western Audits Division
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Kansas City Plant's Vendor Quality Assurance"

BACKGROUND

The National Nuclear Security Administration's (NNSA) Kansas City Plant (Plant), managed and operated by Honeywell Federal Manufacturing & Technologies, LLC (Honeywell), is the primary production site for non-nuclear weapon products. Honeywell procures and produces products based on designs from the Department of Energy's (Department) national defense laboratories (Design Agency). These products must meet demanding specifications and stringent quality requirements.

In April 2013, during an on-site review of one of Honeywell's vendors, Honeywell and Sandia National Laboratories (SNL) discovered that the vendor had deviated from Design Agency requirements on parts supplied to the Plant. Subsequent to this discovery, SNL, the Design Agency for the nonconforming parts, and Honeywell initiated a review to determine the extent of the issue. Initially, Honeywell identified nine substituted materials and processes. The initial review also found that the vendor substitutions were made without Honeywell's approval for more than 25 years – since July 1985. Additional reviews identified another 18 substitutions for a total of 27 deviations from Design Agency requirements. Ultimately, over 10,000 parts were affected with between 1 and 6 substitutions per part. The affected parts had issues with substituted processes, materials, adhesives and/or coatings.

In May 2013, Honeywell officials notified the Office of Inspector General of the vendor substitution issue. In response, we initiated this audit to determine whether Honeywell's quality assurance program for vendors was operating effectively to meet Design Agency requirements.

RESULTS OF AUDIT

Nothing came to our attention to indicate that Honeywell's quality assurance program did not ensure Design Agency requirements were met. Specifically, Honeywell had implemented and NNSA had approved a quality assurance program as required, performed inspections on parts

received from vendors, and documented nonconforming parts when they were identified. In addition, during the same period as our audit, we noted that Honeywell had initiated its own review of the vendor substitution issue to evaluate the impact of the substituted parts. Although Honeywell believed that its overall vendor quality assurance program was effective, it issued two Corrective Action Reports (CAR), which identified certain enhancements that would further ensure that Design Agency requirements continued to be met.

Quality Assurance Program

We found that Honeywell had implemented a quality assurance program for vendor supplied parts as required by Department/NNSA Weapon Quality Policy. Honeywell documented its quality assurance program in its Quality and Management Assurance System Manual through policies and procedures such as process descriptions, work instructions and various forms. Honeywell's policies and procedures required evaluation of the items and materials received from vendors to ensure that they conformed to applicable specifications. The policies and procedures also required Honeywell to document any nonconforming parts. NNSA had approved Honeywell's quality assurance program.

As an integral part of its quality assurance program, we noted that Honeywell performed product inspections. The product inspections performed by Honeywell were accomplished according to an inspection plan which detailed the elements the inspector must review for the selected part. For example, the inspection plan identified what features or characteristics of the part were to be inspected, the sample size or number of parts to be inspected, and the types of equipment used for testing. Honeywell's quality engineers wrote the inspection plans, which were based on the features contained in the Design Agency drawings. In the case of the previously discussed vendor substituted parts, the substitutions were not immediately identified because the inspection plan did not require the materials, adhesives and coatings used in manufacturing the parts to be inspected because the Design Agency did not consider those items to be significant enough to require individual testing.

Further, we noted that Honeywell documented nonconforming parts identified during its vendor quality assurance activities. We selected a judgmental sample of 23 of Honeywell's 209 vendors and requested their nonconformance report (NCR) data for the past 3 years. Honeywell inspected over 19,000 parts from the sampled vendors and more than 3,000 NCRs were issued as a result of the inspections. According to the NCR descriptions, the types of issues included: burrs or nicks, failure to meet dimensional requirements, incorrect markings, failure to meet defined tests, and incorrect documentation. Per Honeywell's policies and procedures, NCRs can be resolved in several ways. For example, the nonconforming part can be accepted based on Design Agency approval, reworked so that it meets specifications, accepted through modified product requirements or scrapped. Honeywell's engineers ultimately determine the disposition of nonconforming parts after applicable consultation with the Design Agency.

Honeywell Corrective Actions

To its credit, Honeywell took proactive action on the vendor substitution issue. For instance, Honeywell initiated a review to evaluate the substituted parts' impact, if any, on weapon

performance. According to both Honeywell and SNL officials, they were primarily concerned with the form, fit and function of a part. Thus, typically, if a part passed the form, fit and function tests as defined by the Design Agency and Honeywell, it would pass inspection. Based on reviews of extensive stockpile surveillance test data, both Honeywell and SNL officials stated that the parts impacted by past substitutions will most likely be accepted because no adverse impact on weapon performance had been identified. The acceptance of the substitutions is expected to be completed by June 2014. In addition, Honeywell officials indicated that the previously discussed substitutions would not impact its production schedule.

Honeywell also assessed controls over quality assurance activities at the vendor and internally. Although Honeywell believed that its overall vendor quality assurance program was effective, it issued two CARs which identified certain enhancements that would further ensure that Design Agency requirements continued to be met. Honeywell issued one CAR to the vendor and the other to itself. The vendor's CAR required corrective actions to strengthen its controls including ensuring that all aspects of a product and its manufacturing processes meet current Design Agency specifications. The vendor completed the corrective actions in August 2013 and Honeywell verified the actions in December 2013.

Honeywell's corrective actions included:

- Performing First Article Inspection (FAI) for selected parts. Because not all aspects of a vendor's part are inspected, Honeywell plans to require vendors to perform to SAE (previously referred to as the Society of Automotive Engineers) Aerospace Standard AS9102A, FAI, on selected parts. According to Honeywell, parts will be selected according to defined criteria such as when the supplier is responsible for all or a portion of the product design and on higher complexity parts. FAI provides objective evidence that all engineering design and specification requirements are properly understood, accounted for, verified and documented. In addition, FAI validates the vendor's production process to ensure that the vendor is capable of producing parts and assemblies that meet engineering and design requirements.

- Requiring vendors to communicate all product changes to Honeywell officials. Purchase Order Quality Requirements advise a vendor to notify Honeywell of changes in production location and processes. However, the requirements did not address material and drawing requirement changes. These were addressed in the contract terms and conditions. Honeywell noted this oversight in the CAR. To correct it, Honeywell's purchasing organization issued an e-mail in September 2013 to its vendors requiring notification of any deviation from drawings or specifications. Honeywell stated that adherence to product and quality requirements is extremely important and potentially impacts national security. In addition to issuing the email, Honeywell also planned to update the Purchase Order Quality Requirements so that vendors must formally notify Honeywell of production changes.

- Conducting Supplier Qualification quality audits to focus on individual parts as well as overall processes. Previously, Honeywell's Supplier Qualification audits focused solely on the vendor's quality management system. Accordingly, the quality audits did not

address compliance with detailed part design requirements. Honeywell also did not perform product specific audits (i.e., auditing how a specific product is made) because product specific audits were only required when a product was first produced or following a major change. Honeywell plans to utilize the FAI process mentioned above to address this issue. Honeywell also plans to streamline quality audit requirements and emphasize product and process requirements.

SUGGESTED ACTIONS

Given Honeywell's actions to address the substitution issue and planned vendor quality assurance program enhancements, we are not making formal recommendations. We do, however, suggest that the Manager, Kansas City Field Office ensure that Honeywell completes all of the actions identified in its CAR and accepts all product substitutions in a timely manner so that Design Agency requirements continue to be met.

We appreciated the cooperation of your staff that provided information and assistance during the audit.

Attachment

cc: Deputy Secretary
Administrator, National Nuclear Security Administration
Chief of Staff

OBJECTIVE, SCOPE AND METHODOLOGY

OBJECTIVE

The audit objective was to determine whether Honeywell's quality assurance program for vendors was operating effectively to meet Design Agency requirements.

SCOPE

We performed the audit between June 2013 and May 2014, at the Kansas City Plant and the Kansas City Field Office in Kansas City, Missouri; Sandia National Laboratories in Albuquerque, New Mexico; and Kansas City Plant vendors in Minneapolis and Rochester, Minnesota. We conducted this audit under Office of Inspector General Project Number A13LV042.

METHODOLOGY

To accomplish the audit objective, we:

- Performed walkthroughs of Honeywell's inspection process in Kansas City and toured Honeywell vendor facilities in Minnesota.

- Interviewed Federal and contractor personnel in Kansas City, contractor personnel in Albuquerque and vendors in Minnesota.

- Reviewed Department/NNSA Weapon Quality Policy and other applicable guidance, policies and procedures.

- Selected a judgmental sample of 23 Honeywell vendors from a population of 209 and reviewed their nonconformance report data for the past 3 years to identify the types of issues inspectors identified when inspecting their parts. We chose a non-statistical sample because of the relatively small size of the universe. We based the sample selection on such factors as type of vendor and types of parts produced. Because selection was based on a judgmental sample, results and overall conclusions are limited to the items tested and cannot be projected to the entire population or universe.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our conclusions based on our audit objective. The audit included tests of controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. In particular, we assessed the implementation of the *GPRA Modernization Act of 2010* and found

that the Department had established performance measures related to quality assurance metrics. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not rely on computer-processed data to satisfy our audit objective.

Management waived an exit conference.

FEEDBACK

The Office of Inspector General has a continuing interest in improving the usefulness of its products. We aim to make our reports as responsive as possible and ask you to consider sharing your thoughts with us.

Please send your comments, suggestions and feedback to OIGReports@hq.doe.gov and include your name, contact information and the report number. Comments may also be mailed to:

Office of Inspector General (IG-12)
Department of Energy
Washington, DC 20585

If you want to discuss this report or your comments with a member of the Office of Inspector General staff, please contact our office at (202) 253-2162.