An Overview of Suspect/Counterfeit Items Discovered at Department of Energy Sites 2006 – 2009

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Office of Corporate Safety Analysis
Office of Health, Safety and Security

Suspect-Counterfeit Items

An item is suspect when inspection or testing indicates that it may not conform to established government- or industry-accepted specifications or national consensus standards or when its documentation, appearance, performance, material, or other characteristics may have been misrepresented by the supplier or manufacturer. A counterfeit item is one that has been copied or substituted without legal right or authority or whose material, performance, or characteristics have been misrepresented by the supplier or manufacturer. A defective item does not meet consensus standards.

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Executive Summary

The Office of Health, Safety and Security (HSS) prepared this study to characterize its experience with the suspect/counterfeit items (S/CI) reporting program. This report aims to provide feedback to the line Quality Assurance community to help craft effective site and supply chain QA strategies to combat the S/CI threat. It is not a comprehensive evaluation of the DOE Quality Assurance, procurement, or site S/CI programs. The study utilizes reports that Department of Energy (DOE) sites filed in the Occurrence Reporting and Processing System (ORPS) from January 1, 2006, through December 31, 2009, and Data Collection Sheets (DCS) created during that same period.

S/CI discovery and reporting is part of the DOE Quality Assurance (QA) program defined by DOE Order 414.1C, *Quality Assurance*; the Order requires that DOE and its contractors procure parts and services from approved suppliers; perform inspection and acceptance testing; and establish requirements for subcontractors and vendors, among other criteria.

To date, the DOE QA system seems to be effectively dealing with the ever-increasing S/CI threat. The study found that S/CI items are found throughout the DOE complex and that the vast majority are reported from the large sites. Interestingly, the number of S/CI discoveries reported in ORPS has remained fairly consistent at about 100 per year or 7.5% of all ORPS reports. Relatively few discoveries are a direct result of another site's ORPS report or the HSS-generated Data Collection Sheets (DCS). S/CI are mainly found during receipt inspection; other inspections and walk-arounds; operations; maintenance; and S/CI sweeps. Front line workers account for about 40% of the total items found. Bolts, fasteners, and shackles are the items identified most often in the reports, followed by valves and electrical components. During the period of this study no injuries, near misses, or shutdowns resulted from S/CI. No events that involved S/CI were rated Significance Category 1, *Significant Impact,* and only two events were rated Significance Category 2, *Moderate Impact. The first event involved Supplier QA Program Deficiencies*, when a vendor failed to implement the requirements of its Quality Assurance (QA) Program; and the second involved *Worker Receiving an Electrical Shock from a Portable Solder Gun*, when a bolt in the gun's handle became energized as a result of a manufacturer's defect caused during assembly. However, defective ammunition and suspect parts for a helicopter, crane, and lifting equipment had the *potential* for serious consequences.

Looking ahead, external research such as that provided by the U.S. Department of Commerce, Bureau of Industry and Security's Office of Technology Evaluation report, *Defense Industrial Base Assessment: Counterfeit Electronics*, indicates that DOE can expect a challenge to its supply chain for electronic parts.

Introduction

The Department of Energy (DOE) has a longstanding suspect/counterfeit items (S/CI) program, executed via the collaborative efforts of Quality Assurance (QA) program managers and coordinators and by various inspection entities at the field sites – ranging from receipt inspectors to QA inspectors to the workers themselves. The Office of Health, Safety and Security (HSS) prepared this study to characterize DOE experience with the S/CI reporting program. This study reflects reports that DOE sites filed in the Occurrence Reporting and Processing System (ORPS) from January 1, 2006, through December 31, 2009, and Data Collection Sheets (DCS) created during that same period.

S/CI discovery and reporting is part of the DOE Quality Assurance program defined by DOE Order 414.1C, *Quality Assurance*. The Order requires that DOE and its contractors procure parts and services from approved suppliers; perform inspection and acceptance testing; and establish requirements for subcontractors and vendors, among other criteria. This study is not a comprehensive evaluation of the DOE Quality Assurance, procurement, or site S/CI programs.

S/CI Program Requirements

DOE Order 414.1C outlines the Department's S/CI prevention process operated by HSS. HSS is responsible for collecting, analyzing, and disseminating S/CI information; notifying Secretarial Officers when specific actions must be taken to investigate and resolve S/CI quality and safety issues; and tracking and reporting the status of corrective actions. All DOE elements must develop a Quality Assurance Plan that addresses 10 quality criteria including Criterion 7 - *Procurement*, and Criterion 8 - *Inspection and Acceptance Testing*. Contractor Requirements Documents (CRD) have corresponding requirements for Procurement and Inspection and Acceptance Testing. Regardless of who performs work at a site, the contractor is responsible for complying with the requirements of the CRD and for disseminating the requirements to all subcontractors to ensure compliance with the requirements and the safe performance of work. Requirements include:

- Developing and implementing an S/CI prevention process commensurate with the facility/activity hazards and mission impact;
- Preventing the introduction and use of S/CI through engineering involvement, design, procurement, testing, inspection, maintenance, evaluation, disposition, reporting, trend analysis, and lessons learned work process controls;
- Training and informing managers, supervisors, and workers on S/CI processes and controls;
- Identifying and disposing of S/CIs onsite; and
- Collecting, maintaining, disseminating, and using the most accurate, up-to-date information on S/CI and associated suppliers using all available sources;
- Reporting discoveries to the DOE Occurrence Reporting and Processing System (ORPS).

G 414.1-3, *Suspect/Counterfeit Items Guide*, describes good S/CI practices, such as using an Approved Suppliers List; purchasing items from dedicated suppliers through Basic Ordering Agreements that provide for pre-established technical and administrative controls and quality verification for the items to be purchased; performing receipt and periodic inspections; promptly reporting S/CI discoveries. In addition, HSS has prepared the *Process Guide for Identification and Disposition of Suspect/Counterfeit Items at Department of Energy Facilities*.

Definitions

An item is *suspect* when inspection or testing indicates that it may not conform to established government- or industry-accepted specifications or national consensus standards or when its documentation, appearance, performance, material, or other characteristics may have been misrepresented by the supplier or manufacturer.

A *counterfeit* item is one that has been copied or substituted without legal right or authority or whose material, performance, or characteristics have been misrepresented by the supplier or manufacturer.

A *defective* item does not meet commercial standards or procurement requirements defined by catalogs, proposals, procurement specifications, testing requirements, or the like. The definition does not include parts or services that fail or are otherwise found to be inadequate because of random failures or errors within the accepted reliability level. (All definitions from DOE Guide 414.1-3)

Methodology

This study was initiated to determine if the S/CI discovery rate has increased or decreased in recent years, to identify the types of S/CI discovered, and to find where in the work process the discoveries occurred. This study was predominantly based on an analysis of ORPS report data as well as on interviews with subject matter experts and personnel responsible for processing the S/CI reports and implementing the program. The study looked at discoveries reported from January 1, 2006, to December 31, 2009.

As information is gained through internal S/CI reporting and external S/CI notifications, HSS pushes the information to the field through a variety of publications. This study reviewed the Data Collection Sheets (DCS), Alerts, Bulletins, and other material published during the four-year period.

Reporting data was obtained through ORPS searches using the search string *Keyword 12R, S/CI and Defective Items*; and searches of the HSS DCS database. The dataset is broadly inclusive; that is, no reports were removed from the tally based on a reading or analysis of the event.

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Number, Locations, and Types of Discovered S/CI

S/CI by Year

Figure 1 and Table 1 show the number of S/CI reports is generally consistent year-to-year for DOE as a whole, but do vary by Program Secretarial Office (PSO) over time. Table 1 also demonstrates that approximately 7.5% of all ORPS reports, or about 100 per year, are S/CI related.

The number of S/CI reports generally follows the scope of operations by PSO. Nearly all PSOs and sites have reported S/CI in this time period; no one is immune. Environmental Management (EM), National Nuclear Security Administration (NNSA or NA), Science (SC), and Nuclear Energy (NE) account for the vast majority of S/CI reports. No other PSO reported more than 10 S/CI events in a single year between 2006 and 2009.

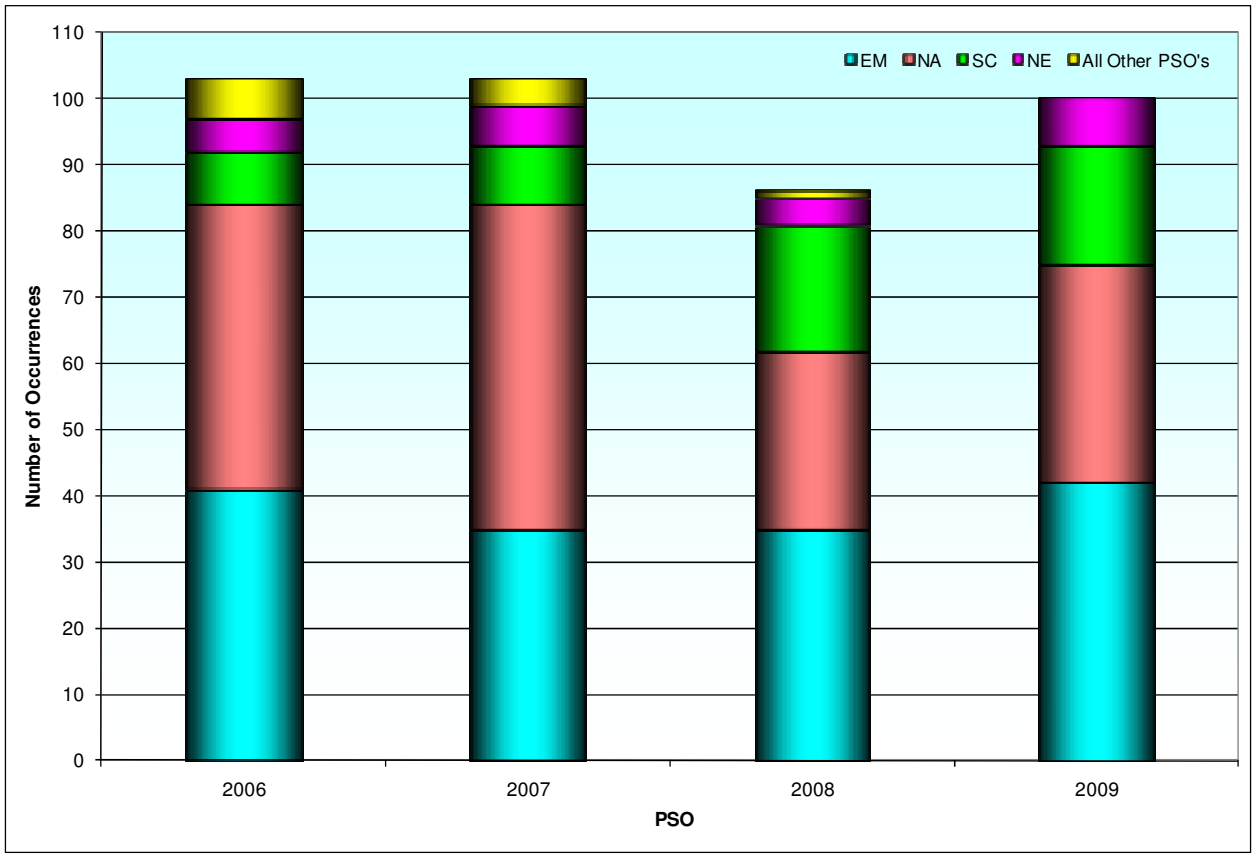

Figure 1: S/CI Reports Filed by PSO 2006-2009

Table 1 shows S/CI ORPS reports filed in the four-year period. The numbers below reflect all the sites.

Table 1: S/CI Reports and Percent of Total ORPS Reports

Year	Annual S/CI Reports	Annual ORPS Total	Percent of Total
2009	100	1187	8.4%
2008	86	1273	6.8%
2007	103	1295	8.0%
2006	103	1491	6.9%
4 Year Total	***392***	***5246***	***7.5%***

S/CI by Site

Based on ORPS data, the sites shown in Figure 2 have filed the most S/CI reports in the 4-year review period. No attempt has been made to determine a cause for the ranking (e.g., strong receipt inspection program, higher inspection percentage, regularly-scheduled S/CI inspections, more training of the workers). However, contractors at Idaho National Laboratory (INL) and the Waste Isolation Pilot Plant (WIPP) have filed several ORPS reports that clearly identify their discoveries as a result of "continuing implementation of the S/CI program," an "S/CI inspection campaign," or "during the annual S/CI review."

Note: INL is shown with both EM and NE because both PSOs have work at the Idaho site. Although the EM work is usually referred to as the Idaho Cleanup Project, the ORPS site name for EM work is still INL.

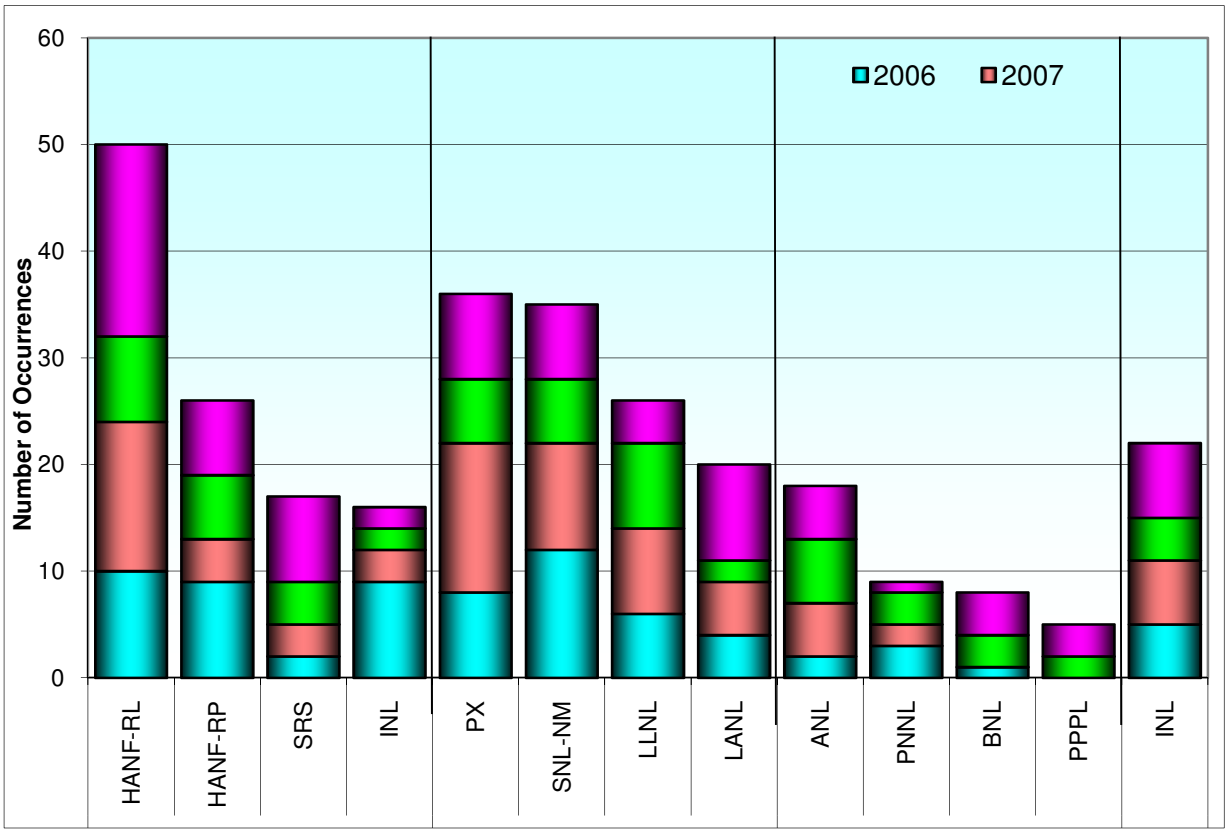

Figure 2: Sites Filing the Most S/CI Reports CY 2006-2009

S/CI by Type

Bolts, fasteners, and shackles were the three items identified most often in the reports, followed by valves and electrical components, as shown in Figure 3. ORPS reports identify the individual part found and do not classify parts into a specific category. The *Other* category includes all other parts that do not have a common characteristic that suggests a logical grouping. *Other* includes soil fixatives, pipe fittings, heat exchangers, flight-critical helicopter parts, ammunition, glovebox bags, hoisting and rigging hardware, fall protection, circuit breakers, drums, parts with deficient welds, couplings, anchors, and fire alarm parts. However, among these, no one type of item was found in sufficient quantities to be depicted graphically based on how it was reported. In addition, some ORPS reports included more than one type of item; as a result, a report may have been counted in more than one category.

Because writers may not use consistent terminology when writing the reports, some items reported in a broader category such as *hoisting and rigging hardware* may actually have been *bolts* or *shackles*.

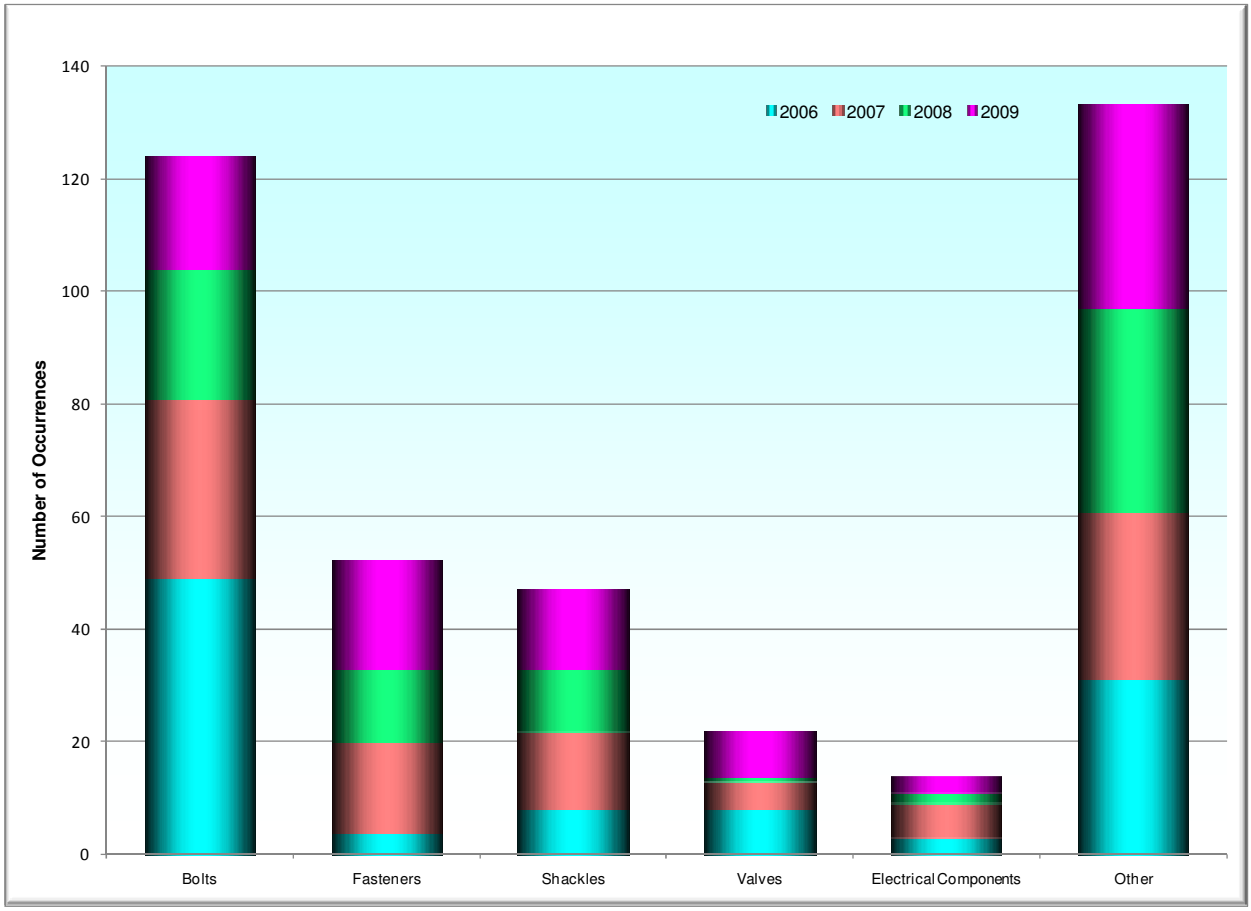

Figure 3: Types of S/CI Reported CY 2006-2009

(Reports may include multiple types of S/CI)

S/CI by Activity

Figure 4 shows the activities that resulted in the discovery of S/CI reported during the period 2006-2009. These activities include receipt inspection, other inspections and walk-arounds, operations, maintenance, S/CI sweeps, and inspections resulting from S/CI Safety Alerts or notifications. Alerts and notifications come from a variety of sources such as the Government-Industry Data Exchange Program (GIDEP), the Institute of Nuclear Power Operations (INPO), the Nuclear Regulatory Commission (NRC), the Federal Aviation Administration (FAA), or the Consumer Product Safety Commission (CPSC).

The ideal scenario would be to have a supply chain QA program that ensures no S/CI are ordered. If something slips through, however, it is best if it is discovered at the receipt inspection. About 19 percent of ORPS reports indicate that S/CI are discovered at that point; the rest are discovered later, after the items are already on site. By far the largest percentage of ORPS reports (41%) document workers' discoveries as they prepare for or perform work. Regular inspections or walk-arounds by QA inspectors, management, Operational Readiness Review teams, etc., are mentioned in 22% of the ORPS reports. Although some sites schedule S/CI campaigns that result in successful sweeps, they are not a major contributor to S/CI discovery; 6% of ORPS reports mention them specifically.

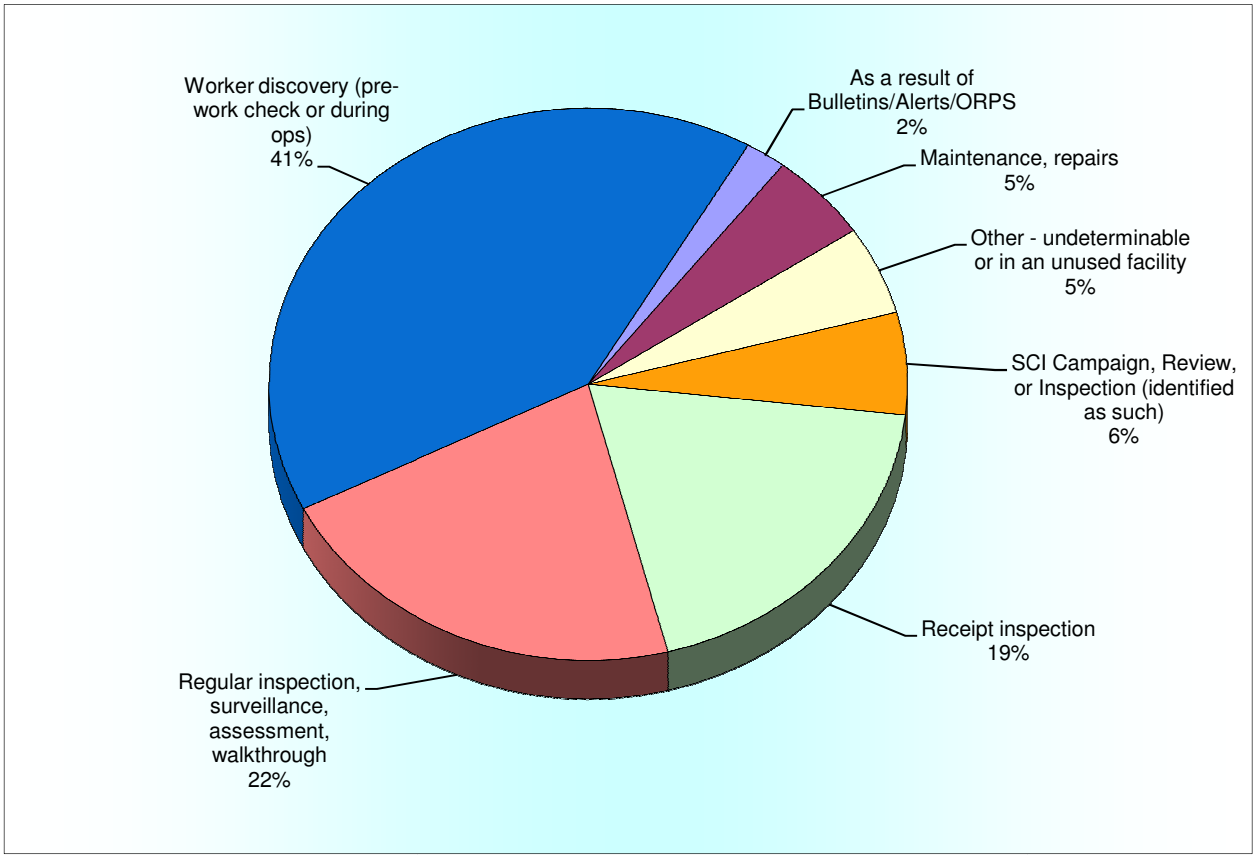

Figure 4: Activities that Resulted in Reported S/CI Discoveries CY 2006-2009

Since S/CI are not a new phenomenon, such items may have made their way into construction, facilities, and equipment before current inspection programs were in place. These older items are regularly discovered by an alert workforce and may be reported as *legacy S/CI*; depending on the item's location, an engineering evaluation may be performed to determine if the item may safely remain in place. This study did not populate a separate *Legacy* category because old, found-in-place items may not always be specifically identified as *Legacy*.

Office of Health, Safety and Security Publications Inform the DOE Complex

HSS creates several types of publications to inform the field of emerging issues; five publications are described below.

Data Collection Sheets (DCS) are created when enough product information is known about a suspect/counterfeit item or its manufacturer/distributor to make that information useful to the field. For example, discovered legacy bolts with no discernible head markings and no paper trail do not warrant a DCS because the field would be unable to do anything with that limited information. On the other hand, if a discovered item had the manufacturer's name, more were in stock, and vendor information was available, a DCS would be generated. In the latter case, enough actionable information is available to help operations organizations proactively identify S/CI in service or upon receipt. Because more than 80% of DCSs result from external information sources, the DCS process is a valuable resource for consolidating, reviewing, and transmitting beneficial S/CI information to the field and DOE's QA system.

Sources such as GIDEP, INPO, NRC, FAA, CPSC, and DOE's own Lessons Learned database are searched regularly for announcements that might be useful to the DOE Complex. In addition, the HSS Corporate Safety Analysis team reviews S/CI ORPS reports as soon as they are submitted to determine whether there is enough information to be useful to the field. If there is, the reported event is assigned *Keyword 13G, Data Collection Sheet* in ORPS, and a DCS is generated.

After the DCS is assigned a tracking number and is posted in the S/CI database, users with approved access can search for items of interest to their site. Readers who desire to use the database may go to http://www.hss.energy.gov/csa/csp/sci/ and select *S/CI-DI Website Access* to complete the registration form.

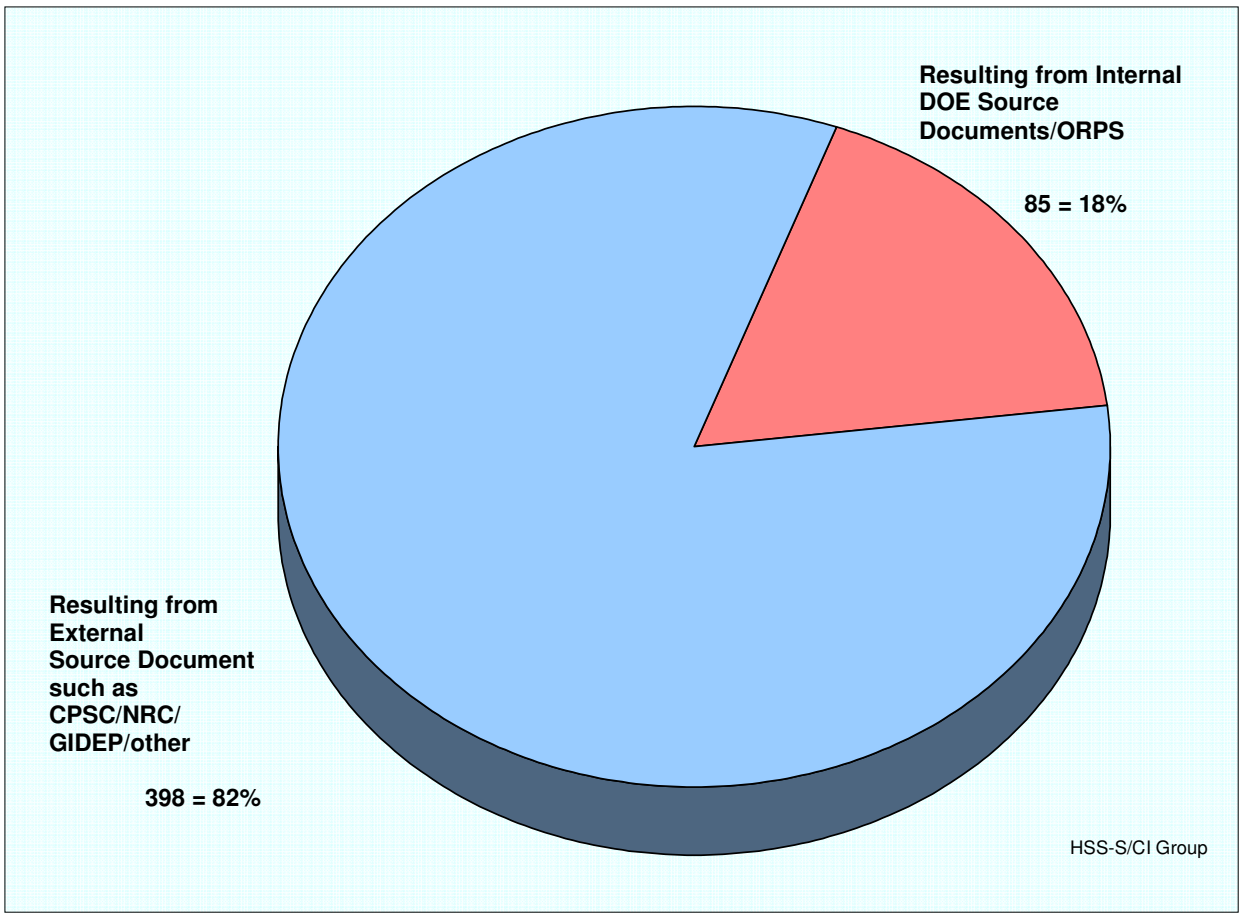

Figure 5: Data Collection Sheets (DCS) Created from Internal and External Sources to Disseminate S/CI Information to the Complex CY 2006-2009

The robustness of the DCS program is evidenced by the fact that the program researches and collects data from multiple sources, many of them external. That variety and volume energize the system and ensure that the DOE workforce receives information from a variety of sources and on a variety of S/CI topics, from those affecting safety at work to those affecting safety at home.

As depicted in Figure 5, the 483 DCSs created during the 4-year study period were the result of a focused effort to find and use all available sources, including GIDEP, INPO, and the CPSC. Key internal S/CI discoveries (documented in ORPS reports) that resulted in DCSs include the following examples.

- DCS 1200, *Suspect Part Discovered on Bell Helicopter Model B-412*, was issued after the Nevada Test Site reported the discovery of a tail-rotor control walking beam without a Bell part or serial number. The discovery of the unmarked flight critical part during scheduled maintenance was documented in ORPS report NA--NVSO-NST-RSL-2007-0001.

- DCS 1408, *Ammunition Failure during Live Fire Training*, was issued after the National Training Center in Albuquerque, New Mexico, filed ORPS report NA--OST-TSD-TSS-2008-0001. During live fire training, an agent experienced a loud detonation from his weapon; inspection showed the handgrips had peeled away from the frame.

- DCS 1456, *Manufacturer (E-Ride) Defects in Fleet of Electric Vehicles*, resulted from the Brookhaven National Laboratory (BNL) ORPS report SC--BHSO-BNL-BNL-2008-0017. BNL reported two defects: A front wheel spindle on one vehicle had broken after only two years of service; a fracture of a horseshoe-shaped bracket on the inside of the engine compartment was noted on all 11 of the site's vehicles.

- DCS 1484, *Chains Used in CM Hoists Have Manufacturing Inconsistencies Which Could Possibly Lead to Failure after Extended Use*, resulted from the Princeton Plasma Physics Laboratory (PPPL) ORPS report SC--PSO-PPPL-PPPL-2009-0004. PPPL reported that one chain was questionable because of gouge defects. The manufacturer stated that the gouges had likely occurred during the bending process and, although the defects did not pose an immediate danger, they could potentially become a fatigue issue later in the chain's life.

Safety Alerts are issued to inform the DOE complex or affected sites of potentially significant issues (i.e., an immediate Conduct of Operations problem, suspect/counterfeit parts, or defective items that *require immediate action*). One S/CI Alert was issued during the study period.

- Safety Alert 2008-01, *Defective Ammunition* (Restricted Access)
  No additional S/CI discoveries could be attributed to issuance of this Alert.

Safety Bulletins are issued on an as-needed basis when operating experience shows a trend that warrants Headquarters and senior management attention. Bulletins *recommend* specific corrective or preventive actions. Four S/CI Bulletins were issued during this period.

- Safety Bulletin 2008-02, *Quality Assurance Concern: Wright Industries, Inc.*
  The Bulletin recommended that each DOE site should review its procurement history for the past two years to determine if Wright Industries, Inc. had been used as a supplier on any project or provided maintenance where NQA-1 requirements apply. This Bulletin was published after Savannah River Site performed an audit of work performed by Wright Industries, Inc., and challenged the adequacy of the extraction furnace module top welds used in the Tritium Extraction Facility (TEF), particularly the weld inspection quality assurance program and the qualifications of craftsmen and inspectors. As a result, the extraction furnace module heater power supplies were de-energized and locked out to prevent furnace operations. Three months later, SRS performed a follow-up audit and removed Wright Industries from the SRS Qualified Suppliers List. (EM-SR--WSRC-MOGEN-2008-0003 and NA--SRSO-WSRC-TRIT-2008-0008)

- Safety Bulletin 2008-01, *Counterfeit Square D Circuit Breakers*
  One additional S/CI discovery was reported as a result of this Bulletin: At Argonne National Laboratory in February 2008, research and development personnel performed a targeted inspection of breaker panels installed in the 2005-2006 time period in response to this Safety Bulletin and found four breakers with characteristics of the counterfeit breakers identified in the Bulletin. (SC--ASO-ANLE-ANLEES-2008-0001)

- Safety Bulletin 2006-03 - *UPDATED: Alleged Falsification of Certifications* (Password required) and

- Safety Bulletin 2006-03: *Alleged Falsification of Certifications* (Password required)
  No additional S/CI discoveries could be attributed to issuance of these Bulletins.

Safety Advisories are issued when an analysis of operating experience data shows an event or trend that warrants Headquarters and senior management *awareness* but is not significant enough to warrant an Alert or Bulletin. Three S/CI Advisories were issued during the period.

- Safety Advisory 2010-01, *Update – Defective Frangible Ammunition*
  The Advisory withdrew the suspension of frangible ammunition described in the previous alert with the exception of 5.56 mm ammunition.

- Safety Advisory 2009-03, *Defective Frangible Ammunition*
  Because defective ammunition presents a safety hazard to the user and others, and the noted failure occurred several times during training, sites were warned to immediately stop using frangible ammunition provided by MAST Technology.
  No additional defective ammunition discoveries could be attributed to issuance of these Advisories.

- Safety Advisory 2008-04, *HEPA Filter Rejection Rates*
  Increased rejection rates of High Efficiency Particulate Air (HEPA) filters during testing at the Filter Test Facility (FTF) operated by Air Techniques International near Baltimore, Maryland, are a concern. In March 2009, Lawrence Livermore National Laboratory filed an ORPS report after it experienced a high HEPA filter rejection rate. (NA--LSO-LLNL-LLNL-2009-0016)

Just-in-Time Reports are two-page documents that *inform* workers and work planners about specific safety issues related to work they are about to perform. DOE uses INPO's highly successful format, which presents brief examples of problems and mistakes encountered in actual cases, and then presents points to consider that should help avoid such pitfalls. One Just-in-Time report about S/CI was issued during the period.

- Just-in-Time Report 2006-03, *Defective MSA Hood Stitching*
  MSA hoods have been found with missing stitching and should be returned to the manufacturer. No additional defective hood discoveries could be attributed to issuance of this Just-in-Time Report.

These publications may make personnel more aware of S/CI, but only a small number of subsequent discoveries are officially credited to them. There may be several reasons for the small number of discoveries that follow publication of a document. Such distribution indicates a conservative management approach to inform a wide audience, not that potentially harmful threats are generally widespread.

Severity of Reported Events Involving S/CI

No events that involved S/CI in the 4-year period were rated Significance Category 1, *Significant Impact,* and only two events were rated Significance Category 2, *Moderate Impact*:

- *Supplier QA Program Deficiencies*, when a vendor failed to implement the requirements of its QA Program. A Washington Savannah River Corporation audit of one of its contractors showed that the contractor was not adequately implementing its quality program for components it fabricated for the Site; was not adequately implementing and managing quality requirements for its sub-tier suppliers; and had not performed quality audits on its sub-tier suppliers. Rigorous implementation of a quality program forms the basis for acceptance of components for nuclear safety systems. Loss of confidence in the contractor's and sub-tier's programs calls into question the ability of the components they supply to perform as required. This event resulted in issuance of Safety Bulletin 2008-02, *Quality Assurance Concern: Wright Industries, Inc.*, described in the previous section. Three months after the initiating event, SRS performed a follow-up audit and removed Wright Industries, Inc., from the SRS Qualified Suppliers List. (EM-SR--WSRC-MOGEN-2008-0003 and NA--SRSO-WSRC-TRIT-2008-0008)

- *Worker Received Electrical Shock from a Portable Solder Gun*, when a bolt in the gun's handle became energized as a result of a manufacturer's defect caused during assembly. (NA--LASO-LANL-BOP-2009-0026) The screw on the handle was energized at 120 volts and was in direct contact with the hot plug on the cord. All solder guns received in the shipment carried the Underwriters Laboratories (UL) seal, but this was the only one found to be defective.

Seven other events, although they were rated Category 3, *Minor Impact*, or Category 4, *Some Impact*, could have had serious consequences as shown by the following examples.

- *Suspect Part Discovered on Bell Helicopter*, when an aviation mechanic discovered that the tail-rotor control walking beam, a flight-critical part, was not marked with a Bell part number or serial number. (NA--NVSO-NST-RSL-2007-0001) The problem was traced to the original manufacture and assembly of the aircraft at Bell Helicopter; inspection of a second aircraft identified the same condition. The parts were immediately replaced.

- *Defective Frangible Ammunition*, when a rifle bolt did not completely seat in the forward, locked position due to the bullet breaking off flush with the front of the casing. (NA--NVSO-WSIN-NTS-2009-0001) All ammunition provided by the vendor was removed from use after several other bullets broke during Live Fire exercises. Safety Advisory 2009-03, *Defective Frangible Ammunition*, was published soon afterward.

Moving Forward

Traditionally, the S/CI discussion has focused on mechanical parts and equipment. Now, however, DOE and all government entities face increased threats of counterfeit electronics, which is the subject of the U.S. Department of Commerce, Bureau of Industry and Security's Office of Technology Evaluation report, *Defense Industrial Base Assessment: Counterfeit Electronics*, released in January 2010.

In June 2007, the Department of the Navy, Naval Air Systems Command (NAVAIR) asked the U.S. Department of Commerce, Bureau of Industry and Security's Office of Technology Evaluation to conduct a defense industrial assessment of counterfeit electronics. NAVAIR suspected that an increasing number of suspect/counterfeit electronics was infiltrating the supply chain and affecting weapons systems reliability. Almost 400 companies and organizations, representing all five segments of the supply chain, participated in the assessment that addressed the period 2005-2008. The data revealed that 39 percent of these companies had encountered counterfeit electronics and that the numbers were increasing. Demonstrated weaknesses in inventory management, procurement, recordkeeping, reporting, inspection, and communication across government and industry were exacerbating the problem.

The Office of Technology Evaluation identified key practices in more than a dozen areas that organizations can implement to improve procurement and inventory management, S/CI detection and reporting, and other areas.

The Office of Technology Evaluation recommendations included the following:

- Establish a centralized Federal reporting mechanism for collecting information about S/CI that could be used by industry and all Federal agencies.
- Modify the Federal Acquisition Regulations to allow for "best value" procurement as well as to require Government suppliers and Federal agencies to report counterfeit parts.
- Establish a dialogue with law enforcement agencies about the need to increase prosecution of counterfeiters and those who knowingly distribute such parts.

The report can be obtained at
http://www.bis.doc.gov/defenseindustrialbaseprograms/osies/defmarketresearchrpts/final_counterfeit_electronics_report.pdf

Conclusion

DOE has a longstanding S/CI program, strengthened by the collaborative efforts of program managers and coordinators and by various inspection entities at the field sites, ranging from receipt inspectors to Quality Assurance inspectors to the workers themselves. This study found:

- No broad impact issues such as injuries, near misses, or shutdowns were associated with S/CI. However, there were a few instances where S/CI items were found that could have produced serious consequences, for example defective ammunition, airplane parts, or lifting equipment.
- The number of S/CI-related ORPS reports was consistent over the 4-year period of this study, about 100 reports per year or 7.5% of the ORPS annual total.
- Workers regularly make the most S/CI discoveries as they prepare for or perform work.
- Bolts, fasteners, shackles, valves, and electrical components are the most frequently reported S/CI mentioned by name. Beyond these "Top 5" there were a very broad set of items found.
- External research, such as that provided by the U.S. Department of Commerce, Bureau of Industry and Security's Office of Technology Evaluation report, *Defense Industrial Base Assessment: Counterfeit Electronics*, indicates that suspect/counterfeit electronics is a growing concern.

References

Analysis and Trending of Suspect-Counterfeit Items at DOE Facilities, 2006
http://www.hss.energy.gov/CSA/CSP/sci/SCDIcy2005.pdf

Data Collection Sheets
http://www.hss.energy.gov/csa/csp/sci/

- DCS 1484, *Chains Used in CM Hoists Have Manufacturing Inconsistencies Which Could Possibly Lead to Failure after Extended Use*
- DCS 1456, *Manufacturer (E-Ride) Defects in Fleet of Electric Vehicles*
- DCS 1408, *Ammunition Failure during Live Fire Training*
- DCS 1200, *Suspect Part Discovered on Bell Helicopter Model B-412*

Department of Commerce, Bureau of Industry and Security's Office of Technology Evaluation, *Defense Industrial Base Assessment: Counterfeit Electronics*, January 2010
http://www.bis.doc.gov/defenseindustrialbaseprograms/osies/defmarketresearchrpts/final_counterfeit_electronics_report.pdf

Department of Energy Order 414.1C, *Quality Assurance*
https://www.directives.doe.gov/directives/current-directives/414.1-BOrder-c/view

DOE Guide 414.1-3, *Suspect/Counterfeit Items Guide*
https://www.directives.doe.gov/directives/current-directives/414.1-EGuide-3/view

DOE-HSS Lessons Learned Database
http://www.hss.energy.gov/csa/analysis/DOEll/index.asp

DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*
https://www.directives.doe.gov/directives/current-directives/231.1-DManual-2/view

DOE Process Guide for the Identification and Disposition of S/CI or Defective Items
http://www.hss.energy.gov/csa/csp/sci/SC-IGuide.pdf

Energy Facility Contractors Group (EFCOG) Publications

- Contractor Alert 2007-001, *Suspect/Counterfeit Items (S/CI) Program Issues*
  http://efcog.org/wg/ism_qa/docs/EFCOG_Alerts/EFCOG_Alert_2007-001_SCI.pdf
- S/CI Guidance Flow Chart for Fasteners
- Suspect/Counterfeit Items Information Guide for Subcontractors/Suppliers (LA-UR-07-3230)
  http://efcog.org/wg/ism_qa/docs/EFCOG_Alerts/SCI_Guide_for_Suppliers.pdf

Integrated Safety Analysis Tool database

Office of Health, Safety and Security Special Publications

- Just-in-Time Report 2006-03, *Defective MSA Hood Stitching*
  http://www.hss.energy.gov/csa/analysis/electrical/jit_2006-03.pdf

- Safety Advisory 2010-01, *Update – Defective Frangible Ammunition*
  http://www.hss.energy.gov/CSA/csp/advisory/SA_2010-01.pdf

- Safety Advisory 2009-03, *Defective Frangible Ammunition*
  http://www.hss.energy.gov/CSA/csp/advisory/Safety_Advisory_signed%20-%20Defective_Ammunition.pdf

- Safety Advisory 2008-04, *HEPA Filter Rejection Rates*
  http://www.hss.energy.gov/CSA/csp/advisory/SA_2008-04_final.pdf

- Safety Alert 2008-01, *Defective Ammunition*
  http://www.hss.energy.gov/CSA/alerts.html (Restricted Access)

- Safety Bulletin 2008-02, *Quality Assurance Concern: Wright Industries, Inc.*
  http://www.hss.energy.gov/CSA/csp/safety_bulletins/sb-2008-02.pdf

- Safety Bulletin 2008-01, *Counterfeit Square D Circuit Breakers*
  http://www.hss.energy.gov/CSA/csp/safety_bulletins/safety_bulletin_2008-01.pdf

- Safety Bulletin 2006-03 - UPDATED: Alleged Falsification of Certifications (Secured)

- Safety Bulletin 2006-03: Alleged Falsification of Certifications (Secured)

Office of Independent Oversight and Performance Assurance*, Special Study of DOE's Management of Suspect/Counterfeit Items*, May-August 2003

Office of Management and Budget Policy Letter 91-3, *Reporting Nonconforming Products*
http://www.whitehouse.gov/omb/procurement_policy_letter_91-3/

Additional Information

Operating Experience Summary Articles 2003-2005

- Issue 2005-02, *Alert: CPSC Recalls Cell Phone Batteries*
  http://www.hss.energy.gov/csa/analysis/oesummary/oesummary2005/oe2005-02.pdf

- Issue 2004-23, *Some MSA Fall Protection Products May Be Deficient*
  http://www.hss.energy.gov/csa/analysis/oesummary/oesummary2004/oe2004-23.pdf

- Issue 2004-11, *Suspect/Counterfeit Items Awareness*
  http://www.hss.energy.gov/csa/analysis/oesummary/oesummary2004/oe2004-11.pdf

- Issue 2004-02, *Good Practice: Impound Salvaged Suspect/Counterfeit Bolts to Prevent Reuse*
  http://www.hss.energy.gov/csa/analysis/oesummary/oesummary2004/oe2004-02.pdf

- Issue 2003-07, *Banned Respirator Hoods Purchased and Used*
  http://www.hss.energy.gov/csa/analysis/oesummary/oesummary2003/oe2003-07.pdf

- Issue 2003-05, *Sharing Lessons Learned Helps Identify Suspect/Counterfeit Bolts in Tie-Down Straps*
  http://www.hss.energy.gov/csa/analysis/oesummary/oesummary2003/oe2003-05.pdf

Appendix A. Acronyms

CPSC	Consumer Product Safety Commission
CRD	Contractor Requirements Document
CY	Calendar Year
DCS	Data Collection Sheet
DOE	Department of Energy
EFCOG	Energy Facility Contractors group
EH	Environment, Safety, and Health (now Health, Safety and Security)
FAA	Federal Aviation Administration
FTF	Filter Test Facility
GIDEP	Government-Industry Data Exchange Program
HEPA	High Efficiency Particulate Air
HSS	Office of Health, Safety and Security
INPO	Institute of Nuclear Power Operations
ISM-WG	Integrated Safety Management Working Group
NA	National Nuclear Security Administration
NAVAIR	Naval Air Systems Command (Department of the Navy)
NE	Office of Nuclear Energy
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
OIG	Office of the Inspector General
ORPS	Occurrence Reporting and Processing System
PSO	Program Secretarial Office
QA	Quality Assurance
QAWG	QA Working Group
SC	Office of Science
TEF	Tritium Extraction Facility
UL	Underwriters Laboratories

DOE ORGANIZATIONS

ANL	Argonne National Laboratory
BNL	Brookhaven National Laboratory
EM	Office of Environmental Management
HANF-ORP	Hanford - Office River Protection
HANF-RL	Hanford - Richland Operations Office
INL	Idaho National Laboratory
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
NA	National Nuclear Security Administration
NE	Office of Nuclear Energy
PNNL	Pacific Northwest National Laboratory
PPPL	Princeton Plasma Physics Laboratory
PX	Pantex
SC	Office of Science
SNL-NM	Sandia National Laboratories-New Mexico
SRS	Savannah River Site
WIPP	Waste Isolation Pilot Plant

Appendix B. Background

The Effort to Discover Suspect/Counterfeit Items

Suspect/counterfeit items (S/CI) are of longstanding interest to DOE and other government agencies, primarily because of the potential safety and mission impacts of nonconforming parts. The Government-Industry Data Exchange Program (GIDEP) was established as a cooperative activity between government and industry participants to share technical information, including information related to potentially defective items. In accordance with the Office of Management and Budget Policy Letter 91-3, *Reporting Nonconforming Products*, agencies are required to establish policies and procedures for using GIDEP to exchange information, examine and disseminate safety-related information, conduct program effectiveness assessments, and establish a process for involving the Office of the Inspector General (OIG) when appropriate.

As the *Background* section of G414.1-3, *Suspect/Counterfeit Items Guide,* explains, DOE first addressed the S/CI issue in the late 1980s after the Nuclear Regulatory Commission (NRC) discovered suspect electrical equipment at commercial nuclear facilities and disseminated Information Notices. At that point, DOE directed its contractors to conduct site-wide S/CI inspections and advise DOE of their findings. In the mid-1990s, a number of S/CI discoveries in DOE facilities prompted DOE to take action to enhance its S/CI management program. Site contractors were directed to review procurement processes and perform facility walk-downs to identify and correct S/CI problems. Also, numerous site personnel were trained on S/CI requirements and in recognizing suspect items. At Headquarters, DOE established the Quality Assurance Working Group (QAWG) in 1996 to support line management in communicating and resolving cross-cutting QA issues such as developing training and S/CI guidance. Although the QAWG was disbanded in 2003, certain functions were retained by the Office of Environment, Safety and Health (now HSS), which assumed corporate responsibility for the S/CI process. That responsibility includes the *DOE Process Guide for the Identification and Disposition of S/CI or Defective Items* and DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information* that provide direction to collect, screen, disposition, and communicate information on S/CI that could potentially impact DOE operations.

According to the Guide, other significant efforts to control S/CI included the following:

- The Fastener Quality Act of 1990 required that fasteners conform to the specifications to which they are represented to be manufactured; provided for the accreditation of laboratories engaged in fastener testing; and required inspection, testing, and certification of fasteners used in critical applications.
- The DOE Office of the Inspector General report, DOE/IG-0304, *Concerns with the Effectiveness of the Department's Quality Assurance Program Regarding Production Substitution Issues*, November 1991, identified numerous suspect fasteners as well as electrical equipment that were found at DOE facilities during 1989 and 1990 OIG inspections.
- Office of Environment, Safety, and Health (EH) Quality Alert Bulletin 92-4, August 1992, summarized previously disseminated U.S. Customs Office information on S/CI and provided the original suspect head mark list.

- Office of Nuclear Energy (NE) 1993 *Plan for the Suspect/Counterfeit Products Issue in the Department of Energy* was issued to DOE field managers with the concurrence of Program Offices to provide a comprehensive approach and schedule for resolving S/CI issues across the DOE Complex. That information is now included in DOE G 414.1-3.
- A DOE Office of Independent Oversight and Performance Assurance study, *Independent Oversight Analysis of Suspect/Counterfeit Parts within the Department of Energy*, 1995, noted a high degree of inconsistency and incompleteness among some DOE sites in addressing S/CI issues.
- The Office of Independent Oversight and Performance Assurance *Special Study of the Department of Energy's Management of Suspect/Counterfeit Items* in 2003 made recommendations for improving the Department's safety posture with respect to S/CI. All DOE Program Offices, field elements, and contractors were requested to use this report as a baseline for conducting self-evaluations of their S/CI controls and making improvements.

Energy Facility Contractors Group (EFCOG) Involvement in the S/CI Effort

EFCOG takes an active role in informing its membership about S/CI issues. In October 2007, EFCOG's Integrated Safety Management Working Group (ISM-WG) issued Alert 2007-01, *Suspect/Counterfeit Items (S/CI) Program Issues.*

A series of events led to the Alert. A DOE contractor's 2005 S/CI trend report with eight events resulted in DOE and NRC representatives questioning the trend and asking why corrective actions had not eliminated or decreased the number of discoveries. The contractor agreed that the S/CI program could be improved and requested that EFCOG lead the effort to benchmark S/CI programs to identify improvements and/or cost savings. As a result, the EFCOG ISM-WG developed a 10-question survey sent to 18 DOE/National Nuclear Security Administration sites. In October 2007, after receiving the responses, EFCOG developed and submitted to HSS its recommendations for DOE S/CI program improvements based on the group's long-standing interest in, and the safety implications of, S/CI. Changes were incorporated that resulted in the current S/CI program.

Periodic Reports

The Annual Report, *Analysis and Trending of Suspect-Counterfeit Items at DOE Facilities*, is available for the years 2004-2006.