NOT MEASUREMENT SENSITIVE

DOE G 414.1-3
11-3-04

SUSPECT/COUNTERFEIT ITEMS GUIDE

for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1B, *Quality Assurance*

[This Guide describes suggested nonmandatory approaches for meeting requirements. Guides are not requirements documents and are not to be construed as requirements in any audit or appraisal for compliance with the parent Policy, Order, Notice, or Manual.]

U.S. Department of Energy
Washington, D.C.

AVAILABLE ONLINE AT:
http://www.directives.doe.gov

INITIATED BY:
Office of Environment, Safety and Health

FOREWORD

This Department of Energy (DOE) Guide is approved by the Office of Environment, Safety, and Health (EH), and is available for use by all DOE and National Nuclear Security Administration (NNSA) Elements and their contractors. This Guide revises and supersedes earlier guidance identified in Appendix 2 to include new and updated information.

Comments, including recommendations for additions, modifications, or deletions, and other pertinent information, should be sent to the following:

Gustave E. Danielson, Jr.
U.S. DOE
Office of Quality Assurance Programs
10001 Germantown Road
Germantown, MD 20874-1290
Phone: 301-903-2954
Fax: 301-903-6172
e-mail: bud.danielson@hq.doe.gov

Paul Chimah
U.S. DOE/NNSA
Albuquerque Service Center
P.O. Box 5400
Albuquerque, NM 87185-5400
Phone: 505-845-6362
Fax: 505-845-4664/4718
e-mail: pchimah@doeal.gov

Guides are part of the DOE directives system and are used to provide supplemental information regarding DOE/NNSA expectations for fulfilling requirements contained in Policies, Rules, Orders, Manuals, Notices, and Regulatory Standards. Guides are also used to identify Government and non-Government standards and acceptable methods for implementing DOE/NNSA requirements. Guides are not substitutes for requirements, nor do they introduce new requirements, and should not replace technical standards used to describe established practices and procedures.

BACKGROUND

Some manufacturers and suppliers use inferior materials and processes to make substandard items whose properties can vary significantly from established standards and specifications. Substandard materials known as suspect/counterfeit items (S/CIs) pose immediate and potential threats to the safety of DOE/NNSA and contractor workers, the public, and the environment. Failure of a safety system due to an S/CI could also have security implications at DOE/NNSA facilities.

Purchasers have also been misled by falsified documentation into accepting items that do not conform to specified requirements. The most common S/CIs found at DOE facilities have been threaded fasteners and refurbished electrical circuit breakers.

DOE first addressed the S/CI issue in July 1988, upon receipt of the U.S. Nuclear Regulatory Commission (NRC) Notice 88-96. NRC discoveries of suspect electrical equipment at commercial nuclear facilities led DOE to direct its contractors to conduct site wide S/CI

inspections and advise DOE of their findings. Other significant efforts to control S/CIs include the following.

- The Fastener Quality Act of 1990 [1] requires that fasteners conform to the specifications to which they are represented to be manufactured. It also provides for the accreditation of laboratories engaged in fastener testing and requires inspection, testing, and certification of fasteners used in critical applications. The Fastener Quality Act, Public Law 101-592 codified under 15 CFR Part 280, *Fastener Quality* [2] prescribe additional requirements to deter the introduction of nonconforming fasteners into commerce.

- The DOE Office of the Inspector General (OIG) report, DOE/IG-0304, *Concerns with the Effectiveness of the Department's Quality Assurance Program Regarding Production Substitution Issues;* [3], issued in November 1991, identified numerous suspect fasteners and electrical equipment that were found at DOE facilities during OIG inspections in 1989 and 1990.

- EH Quality Alert Bulletin 92-4 [4], issued in August 1992, summarized previously disseminated U.S. Customs Office information on S/CIs. The suspect headmark list in this bulletin is still valid.

- The Office of Nuclear Energy, *Plan for the Suspect/Counterfeit Products Issue in the Department of Energy,* (1993 Plan), October 1993 [5] 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. The information in this plan has been updated and included in this Guide.

- An EH study, *Independent Oversight Analysis of Suspect/Counterfeit Parts Within the Department of Energy* [6], published in November 1995, noted a high degree of inconsistency and incompleteness among some DOE sites in addressing S/CI issues. A follow-up study conducted May 1996 [7] found improved procurement procedures that were effective in reducing the introduction of S/CI. However, this study also noted that further improvements were needed in the coordination, integration, and dissemination of S/CI information.

- The Office of Independent Oversight and Performance Assurance, *Special Study of the Department of Energy's Management of Suspect/Counterfeit Items*, was published in August 2003 [35]. The report made several recommendations for improving the Department's safety posture with respect to S/CIs. All DOE program offices, field elements, and contractors were requested to use this report as a baseline for conducting self-evaluations of the effectiveness of their S/CI controls and making any needed improvements in their S/CI processes.

Though DOE made considerable progress in implementing the 1993 plan to resolve S/CI issues, the DOE/IG-0304 report findings remained open, and the 1995 EH study pointed to the need for additional actions. The Under Secretary of Energy appointed a DOE Senior Manager's Task Group to resolve these S/CI issues. The task group report, issued in June 1996 [8], stressed the importance of effective quality assurance (QA) programs for mitigating the impact of S/CIs on

DOE's mission. It outlined specific actions for resolving identified S/CI issues. One action established the DOE QA Working Group (QAWG) to aid line management in the prevention and identification of S/CIs. The QAWG provided a forum for the resolution of Department-wide quality problems, shares timely quality issue information, and provides input to the DOE directives. The QAWG was disbanded in 2003 and certain functions were retained by the Office of Environment, Safety, and Health (EH). EH then assumed corporate responsibility for the S/CI process. EH developed a process guide and supporting manual to provide direction on implementing the S/CI process to collect, screen, disposition, and communicate information on S/CI that could potentially impact operations at DOE facilities.

ACKNOWLEDGMENTS

DOE/NNSA acknowledges and thanks the following individuals and organizations for their expert contributions to and support of this Guide.

TEAM MEMBERS

Gustave (Bud) Danielson, Jr., Team Lead
Office of Environment, Safety and Health
U.S. Department of Energy

Paul Chimah
Albuquerque Service Center
U.S. Department of Energy/NNSA

Paul Gervas, Esq.
Office of General Counsel
U.S. Department of Energy

Joe Maday, Jr.
QA Programs
Fluor Hanford

Yvette R. Milam
Office of Inspector General
U.S. Department of Energy

Jerry L. Southard
Procurement Quality Manager
BWXT Idaho

Dave L. Torczon
DB Associates

CONTENTS

CONTENTS (continued)

ACRONYMS

AC	alternating current
ANSI	American National Standards Institute
ASQC	American Society for Quality Control
ASME	American Society for Mechanical Engineers
BOA	Basic Order Agreement
CAS	condition assessment survey
CMTR	certified material test report
C of C	certificate of conformance
DC	direct current
DOE	U.S. Department of Energy
EH	Office of Environment, Safety, and Health
EM	Office of Environmental Management
EPRI	Electric Power Research Institute
GIDEP	Government-Industry Data Exchange Program
IAEA	International Atomic Energy Agency
ICPT	Integrated Contractor Purchasing Team
IFI	Industrial Fasteners Institute
INPO	Institute of Nuclear Power Operation
ISO	International Organization for Standardization
NCR	nonconformance report
NNSA	National Nuclear Security Administration
NRC	U.S. Nuclear Regulatory Commission
OEM	Original Equipment Manufacturer
OIG	Office of the Inspector General
ORPS	Occurrence Reporting and Processing System
QA	quality assurance
SAE	Society of Automotive Engineers
S/CI	suspect/counterfeit item
SQIG	DOE Contractor's Supplier Quality Information Group
UL	Underwriters Laboratories Inc.

1. INTRODUCTION

DOE O 414.1B [9] and Title 10 Code of Federal Regulations (CFR) 830 Subpart A [10], set forth requirements for DOE/NNSA and its contractors to implement effective controls to assure that items and services meet specified requirements. DOE O 414.1B further requires DOE/NNSA and its contractors to implement processes to prevent entry, detect, control, report, and disposition S/CIs as part of their quality assurance (QA) programs. DOE O 231.1A, ENVIRONMENT, SAFETY, AND HEALTH REPORTING [12] and DOE M 231.1-2, OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS IMFORMATION [13], specify requirements for reporting S/CIs under the DOE Occurrence Reporting and Processing System (ORPS). DOE promulgated the requirements and guidance to control or eliminate the hazards posed by S/CIs, which can lead to unexpected equipment failures and undue risks to the DOE/NNSA mission, the environment, and personnel. DOE G 414.1-2, QUALITY ASSURANCE GUIDE for use with 10 CFR 830.120 and DOE O 414.1[11], provides additional guidance on establishing and implementing effective QA processes to control S/CIs.

The goal of this document is to provide guidance that will assist DOE/NNSA and its contractors mitigate the safety threat of S/CIs. It includes techniques that can be used to strengthen controls in the procurement process thus minimizing the potential for entry of S/CIs to DOE/NNSA facilities. This guidance places specific emphasizes on engineering involvement and improved reporting so that information on S/CIs may be readily shared with other DOE/NNSA facilities. Particular attention is also placed on S/CIs installed in safety systems, critical lifting equipment and mission critical facilities. The information in this Guide, when effectively implemented by DOE/NNSA and its contractors, provides controls to prevent entry, detect, control, report, and disposition S/CIs and satisfy the applicable directives.

This Guide is a compendium of information about S/CIs and recommended controls found in the referenced DOE directives and other documents. It revises and supersedes DOE G 440.1-6, *Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10 CFR 830.120; and DOE O 5700.6C, Quality Assurance*, dated June 1997. It contains examples of common S/CIs and their indicators that have been identified by various sources. Please refer to the DOE EH S/CI Web site at http://www.eh.doe.gov/sci/ for current examples of S/CI discoveries and their indicators.

This revision incorporates updated and additional information regarding the following.

- Field experience gained from S/CI process implementation;
- Lessons learned and recommendations from the Office of Independent Oversight and Performance Assurance, *Special Study of the Department of Energy's Management of Suspect/Counterfeit Items*. [35]
- DOE EH and line organization S/CI process roles and responsibilities
- Trending, analysis, reporting, and awareness training on S/CI issues.

2. APPLICATION

This Guide is intended for use by all DOE/NNSA organizations and contractors to assist them in developing site-and facility-specific QA policies, processes, and procedures to address the following S/CI controls:

- Procurement;
- Item inspection and acceptance;
- Engineering involvement;
- Safety systems, non-safety systems, and critical load paths;
- Identification, notification, disposition and disposal;
- Reporting;
- Trend analysis;
- Training; and
- Assessment and oversight.

The controls described in this Guide are based on implementation experience, lessons learned, and good practices of both DOE/NNSA and contractor organizations. Existing DOE and contractor S/CI controls should be compared with this Guide to ensure that they address DOE/NNSA requirements and expectations. Additional or alternative methods of controlling S/CIs may be acceptable if the methods adequately ensure both worker and public safety and product quality.

This Guide may be used in assessing the adequacy of implementation of S/CI controls through the following processes:

- Quality Assurance Programs.
- Integrated Safety Management System Policy [14].
- Procedures, manuals, instructions.
- Work Smart Standards sets [15] prepared in response to DOE S/CI requirements.

3. GENERAL INFORMATION

3.1 SUSPECT/COUNTERFEIT ITEMS

A suspect item is one in which visual inspection, testing, or other means indicate that it may not conform to established Government or industry-accepted specifications or national consensus standards; or one whose documentation, appearance performance, material, or other characteristics may have been misrepresented by the supplier or manufacturer. A counterfeit item is a suspect item that has been copied or substituted without legal right or authority to do so

or one whose material, performance, or characteristics are misrepresented by the supplier or manufacturer. An item that does not conform to established requirements is not normally considered an S/CI if the nonconformity results from one or more of the following conditions, which are controlled by site procedures as nonconforming items:

- Defects resulting from inadequate design or production quality control;
- Damage during shipping, handling, or storage;
- Improper installation;
- Deterioration during service;
- Degradation during removal;
- Failure resulting from aging or misapplication; or
- Other controllable causes.

An item identified as S/CI may have one or more of the indications described above and **not** be fraudulent. If an item exhibits some of the indications listed above it may warrant further investigation and be considered suspect. Contact with the supplier and/or manufacturer may help establish whether the item in question has a quality control problem or is actually fraudulent. This guide provides information to assist in making the distinction between routine nonconforming items and S/CIs.

3.2 OBJECTIVES FOR THE CONTROL OF S/CIs

DOE/NNSA is committed to effective controls for the prevention, detection, and disposition of S/CIs to mitigate any potential safety threat in the DOE/NNSA complex. In accordance with the requirements of DOE O 414.1B, the principal objectives of S/CI controls are as follows:

- Ensure that items intended for application in safety systems and mission critical facilities comply with design and procurement documents.
- Maintain current, accurate information on S/CIs and associated suppliers using all available sources within the Government and industry and disseminate relevant information on S/CIs to field organizations and contractors.
- Identify, control, and disposition S/CIs that create potential hazards in safety systems and applications.
- Report discoveries of and disseminate information about S/CIs to field organizations, contractors, and government agencies.
- Train and inform managers, supervisors, and workers of S/CI controls and indicators, including prevention, detection, and disposition of S/CIs.

These controls should also include obtaining contractual remedies from suppliers of S/CIs.

3.3 PRINCIPLES OF DEFENSE-IN-DEPTH AND GRADED APPROACH

S/CI controls are based on two longstanding DOE/NNSA safety principles: defense-in-depth and graded approach. Defense-in-depth refers to the multiplicity of design features, controls, and actions taken to ensure public and worker safety. Under an effectively implemented QA program, a comprehensive network of controls and verification provides for defense-in-depth by preventing the introduction of S/CIs during the design, procurement, construction, operation, maintenance, or modification processes at DOE/NNSA sites and facilities. Though the graded approach applies to safety systems, non-safety systems, and mission critical facilities, DOE/NNSA organizations and contractors should focus their resources and priorities on those safety systems and mission critical facilities, including critical load paths of lifting equipment, where the introduction of S/CIs would have the greatest potential for creating unsafe conditions.

3.4 EXAMPLES OF S/CIs

DOE/NNSA and its contractors have learned that S/CIs can encompass a broad range of items, including, but not limited to:

- Threaded fasteners; including assemblies containing fasteners such as ratchet tie down straps;
- Electrical components (circuit breakers, semi-conductors, current and potential transformers, fuses, resistors, switchgear, overload and protective relays, motor control centers, heaters, motor generator sets, DC power supplies, AC inverters, transmitters, GFCI's);
- Piping components (fittings, flanges, valves and valve replacement products, couplings, plugs, spacers, nozzles, pipe supports); and
- Preformed metal structures, semiconductors, elastomers (O-rings, seals), spare or replacement kits from suppliers other than original equipment manufacturers, weld filler material, diesel generator speed governors and pumps.
- Material; including sheet strip, castings and other forms particularly involving those materials for which special processes are required (i.e., welding, heat treating) for conformance to specifications.

The following information presents a sample of S/CIs discovered at DOE/NNSA sites. In addition, Appendix 4 presents examples of some common S/CIs and their indicators. The DOE EH S/CI Web site at http://www.eh.doe.gov/sci/ contains current information on S/CI indicators, discoveries and photographs in the reference section.

Temperform USA Falsified Heat Treat and Inspection Processes: Heat treating is a critical process because it changes alloy properties to attain specified strength, hardness, and corrosion resistance and fatigue life. Each part has special heat treat requirements. These requirements must be performed correctly. Improper heat treating could lead to the following adverse conditions: Lowered *strength,* reduced corrosion resistance, more susceptible to cracking and reduced fatigue 1ife expectancy. Deviations in the heat treat process could result in the part not functioning as intended, nor would it have the reliability it was designed to have.

In May 2001, the Defense Criminal Investigative Service (DCIS), Western Field Office, initiated an investigation of Hydroform USA (Hydroform), and its subsidiary, Temperform USA (Temperform), The investigation focused on falsification of all aspects of the heat treat and quality inspection process, which affected United States Department of Defense (DOD), and National Aeronautics and Space Administration (NASA) and commercial aircraft aluminum components.

Temperform and its parent company, Hydroform manufactured airframe detailed parts, subassemblies, and kits for the aerospace industry. Temperform provided false certifications for aluminum alloy parts to DOD and NASA contractors, and commercial customers from May 1998 through at least September 2001. The most flagrant and consistent issues were falsification of heat treat processes and quality inspections during the period July 1999 through March 2000.

In October 2001, search warrants were executed at Hydroform and Temperform. Interviews with numerous former and current employees and review of thousands of related seized documents revealed that Hydroform and Temperform processed components are likely used in at least 14 commonly used Boeing commercial aircraft and at least 25 major DOD/NASA programs used by various branches of the U.S. Government.

Solid State Device Inc. (SSDI): On March 21, 1995, the Los Angeles Field Office, Defense Criminal Investigation of the DOD initiated an investigation of potentially defective nonconforming semiconductors devices, diodes and transistors used on a variety of hardware procured by the U.S. Army, Navy and Air Force and DOE/NNSA.

The investigation revealed that SSDI related semiconductor devices supplied by another company that procures these devices from commercial source, including oversees suppliers. The investigation further disclosed that these devices had falsified cycling logs and dates codes.

The Assistant Secretary for Environment, Safety and Health issued a Quality Alert on Suspect/Counterfeit Semiconductors in February 1997. Notifying DOE facilities and contractors that SSDI of California may have been marketing electronic components, which do not meet performance specifications. These semiconductors could fail in critical applications.

Stainless Steel Fasteners: Improper marking of stainless steel fasteners was addressed in DOE EH Safety & Health Bulletin No. 97-6, November 1997, *DOE Quality Assurance Working Group Suspect/Counterfeit Item Advisory – Suspect/Counterfeit Stainless Steel Fasteners* [36]. This was based on an advisory issued by the Industrial Fastener Institute (IFI) regarding 18-8 stainless steel fasteners. The advisory warns of a "bait and switch" tactic in which a distributor would sell an 18-8 fastener (indicated by two radial lines 90 degrees apart but without a manufacturer's marking) as ASTM International A320 Grade B8 fastener after hand-stamping B8 on the head. The initial concern identified dual stamping, both raised and depressed markings, on the head. A number of DOE sites inspected their stock and found similar dual-stamped stainless steel fasteners.

The ASTM International A193 standard specifies fastener marking and certification similar to those required by the ASTM International A320 standard discussed in the IFI advisory. ASTM

International A193 requires the grade and manufacturer's identification symbols to be applied to the heads of fasteners larger than 1.4" diameter. However, the standard does not differentiate between raised and depressed head markings, it only states that for purposes of identification marking, the manufacturer certifies that the fastener was manufactured, sampled, tested, and inspected in accordance with the standard. In other words, it allows for some of the required markings to be formed into the head during manufacturing, either by being raised or lowered, and the remainder to be applied later by hand stamping. Since ASTM International A193 does not differentiate between raised and depressed head markings, these fasteners can be counterfeited in the same way as ASTM International A320 fasteners discussed in the IFI advisory. Without the manufacturer's certification, there is no way to determine by visual inspection alone whether the fasteners meet the requirements of the ASTM International A193 standard for Grade B8 Class 1.

Refurbished Molded-Case Circuit Breakers: Molded-case circuit breakers (MCCB) continue to be widely refurbished and misrepresented as new. Investigation has determined that MCCB's previously in service are being refurbished and sold to DOE/NNSA contractors as new. MCCB's are not intended to be disassembled and services or refurbished except by the original manufacturer. Such work by any other sources, unless otherwise authorized by the purchaser, should be considered suspect. Only the original manufacturer and other qualified sources should be used for refurbishment, testing and certification that the MCCB meets applicable requirements.

Metal Struts: DOE facilities should procure and use metal strut materials for structural applications only from reputable and qualified sources. These items typically have the manufacturer's name, logo, or part number on the item and identify the load capacity. DOE contractors have reported instances where suppliers have mixed unmarked substitute struts with properly identified items, shipped in the qualified manufacturer's package, thus misrepresenting the substitute items as being from the OEM.

Semiconductors: Defective semiconductor devices, diodes and transistors have been discovered in military aircraft, space systems, weapons systems, and civilian and military radar systems. Investigations have disclosed that these semiconductor devices do not conform to military or purchase order specifications. Some reported non-conformances include improper soldering, corroded or outdated components being cleaned and sold as new, and falsification of test data.

Miscellaneous: Following are some examples of indications of miscellaneous suspect/counterfeit items discovered at DOE/NNSA sites.

- Metal flanges with two sets of contradictory markings. One set of markings described the item as forged and the other set indicated it was cold rolled.
- Metal flanges, included as part of fabricated assemblies without any required markings on the flanges (i.e., manufacturer, material type, specification, or dimension).

- Metal eyebolts with no manufacturer's mark, or with markings indicating they were made in China. The eyebolt dimensions did not meet specification and material types were indeterminate.
- Pipe and fittings requested from U.S. manufacturers were received from foreign manufacturers.
- Lifting devices visibly altered by over-stamping or striking through original information and adding new markings.
- Suspect/counterfeit stainless steel wire rope discovered in lifting systems.
- Ratchet straps and tie down straps containing suspect/counterfeit fasteners.
- Critical load paths of lifting equipment including both fixed and mobile cranes, scissor lifts, man lifts. balers, truck and dock lifts, conveyors, slings, elevators, and fork lifts;
- Aircraft; (engines and attachments, structural members, wings, tails, or landing gear);
- Vehicles; (engines, brakes, or steering mechanisms);
- Facilities; (valves, compressors, and vessels used to contain radioactive fluids, high-temperature or high-pressure steam or fluids, or other hazardous material or safety systems supporting safe operation or shutdown of a facility or process)

4. CONTROLS

4.1 PROCUREMENT

4.1.1 General

DOE O 414.1B establishes requirements to prevent the introduction of S/CIs into the DOE complex during the procurement process. Additional information on procurement controls is contained in other referenced sources, including the American Society for Mechanical Engineers (ASME) standard ASME NQA-1 [16]; International Organization for Standardization (ISO) standard ISO 9001-2000 [17]; and the International Atomic Energy Agency (IAEA) document IAEA-TECDOC-919 [18].

The underlying principles in procurement include:

- Purchasers must assure that suppliers have demonstrated they are capable of delivering acceptable items in a timely manner and
- Both the extent of procurement controls and verification activities are commensurate with the importance of the item to safe and reliable operation.
- Persons involved in the procurement process should receive training in S/CI awareness and prevention methods.

The procurement process begins with a procurement request and acquisition planning which establishes requirements for what items are needed and special procurement requirements, which may be added to standard boilerplate terms and conditions. The enforcement of the terms and conditions by cognizant organization and procurement officials is necessary so that contractual requirements are not waived or relaxed by acquiescence.

A key element of the procurement process is the specification. The specification should be developed by engineering and establish the technical and quality requirements, including applicable codes and standards the item must meet. A graded approach is applied based on the specific application and the potential impact of failure of the item on the health and safety of the public, environment, or worker resulting in determination of specific quality controls and verification methods, such as quality assurance audit and/or source surveillance at the suppliers' facility, receipt inspection, and post installation inspection and test. Engineering involvement in the procurement process is addressed in paragraph 4.3 below.

Items intended for use in safety systems and mission critical facilities should be procured from suppliers whose quality assurance programs have been evaluated by the purchaser, other DOE contractors, or third party certification agencies. Items procured for use in non-safety systems which are subsequently upgraded for use in safety systems, should be subjected to the same controls and verification (including the use of qualified suppliers, inspection and acceptance testing) applied to safety systems and mission critical facilities. Items procured through surplus or other uncontrollable channels for use in safety systems and mission critical facilities should be supported by documentation of their conformance that has been validated by the purchaser or, in the absence of such documentation, verified for acceptability by inspection or acceptance testing. Specifications for commercial grade items intended for use in safety systems and mission critical facilities should identify the critical characteristics of the item and specify the verification attributes for acceptance to the appropriate grade level.

DOE and its contractors should be cautious about accepting items based solely on supplier-generated documentation or part-number verification, unless the supplier's quality system for generating the documentation and maintaining part number configuration control has been previously verified through performance-based evaluations.

In addition, when the supply chain involved multiple suppliers, each step in the supply chain process should be validated by audit, source inspection, or other methods as appropriate. To control entry of S/CIs through the procurement process, contractor QA programs should implement procedures for:

- Control of procurement processes
- Procurement specification development;
- Inclusion of quality assurance and S/CI clauses in procurement documents;
- Performance of procurement document technical and quality review;
- Legal review of contracts for interpretation of relevant contract terms and conditions;
- Supplier past performance information;

- Maintaining approved supplier lists;
- Performing source or receipt inspection, surveillance, or performance-based audits; and
- Technical validation of product acceptability, including performance of specific inspections and tests.
- Utilization of supplier quality information sharing processes.

4.1.2 Approved Suppliers

Any item subject to S/CI concerns (e.g., raw material, fasteners, electrical components, valves, fittings, ratchet straps, and other S/CIs listed in Appendix 4 and on the DOE EH S/CI home page at http://www.eh.doe.gov/sci/) should be procured from approved suppliers, particularly items intended for use in safety systems.

Supplier approval may be achieved by the following means.

- By conducting quality assurance and technical evaluation (i.e., performance-based audit, assessment, or surveillance) of a supplier's QA program; the results should be factored into source or site inspection and testing to validate product acceptability.

- Through utilization of supplier quality information obtained from the DOE Contractor's Supplier Quality Information Group (SQIG), or other similarly chartered and nationally recognized organizations; exchanging supplier quality information should optimize the use of audit resources and experiences and facilitate timely identification of potentially substandard items.

The SQIG is a DOE/NNSA-wide cooperative of DOE/NNSA contractors organized to minimize duplicate contractor evaluations of suppliers and relieving suppliers of redundant evaluations, resulting in improved customer-supplier relationships, and reduction of suppler evaluation costs.

The SQIG maintains a common supplier database of evaluated suppliers, which is accessible by its membership. Each organization using information shared by the SQIG is responsible for evaluation of the data to determine its acceptability for specific application at their respective site. Further information can be obtained from the SQIG home page at http://www.lanl.gov/sqig/sqighome.html.

Items may also be procured from dedicated suppliers through Basic Ordering Agreements (BOA), which provide for pre-established technical and administrative controls and quality verification for the items to be purchased. The Integrated Contractor Purchasing Team (ICPT) has established BOA's for various items including, fasteners. The ICPT has partnered with the SQIG to establish several BOA's, which include quality assurance evaluation of the supplier as part of the BOA. Users should verify this has been accomplished prior to using the BOA's for procurement of items subject to S/CI concerns. Further information may be obtained from the ICPT home page at http://bechteljacobs.com/icpt. When no qualified or dedicated supplier exists, the potential supplier's capabilities and the adequacy of their QA program should be verified by performance-based evaluations.

Guidance on supplier qualification and dedication and other procurement controls is provided in DOE G 414.1-2, Electric Power Research Institute (EPRI) NP-5652, *Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications* (NCIG-07) [19], DOE 4330.4B, MAINTENANCE MANAGEMENT PROGRAM [20], ASME NQA-1, and ASME FAP-1-1000 [21]. Additional information on procurement and receipt of items is included in the EPRI guidelines, NP-6629 [22]. EPRI NP-6630 [23] contains information on performance-based supplier audits.

4.1.3 Collection and Use of Past Performance Information

Section 10.91 of the Federal Acquisition Streamlining Act of 1994 [24] requires consideration of past performance information in evaluating suppliers. This law represents a change from evaluating offers based primarily on low costs to procuring products from qualified suppliers that represent the best offer to the Government. DOE Acquisition Regulation Acquisition Letter 95-08 [25] defines policy and procedures for the collection, evaluation, and use of past performance information in contracts expected to exceed $100,000. In addition, the regulations allow DOE to consider a history of poor performance as a basis for excluding suppliers who continue to deliver substandard products, including those containing S/CIs, after providing certain due process rights to those suppliers.

4.1.4 Purchase Orders, Contracts, and Quality Clauses

Purchase orders and contracts should contain specific quality clauses prohibiting delivery of S/CIs, including provisions prohibiting subcontractors from bringing S/CIs on site, holding subcontractors accountable for replacing S/CIs at their expense. Procurement documents for items should also specify the appropriate technical specifications, QA standards, and documentation requirements [e.g., Certificate of Conformance (C of C), Certified Material Test Reports (CMTRs), and other supplier generated documentation]. The following S/CI quality clause addresses S/CI concerns and is recommended as a standard clause for inclusion in procurement documents (items and services) regardless of their safety classification.

"Notwithstanding any other provisions of this agreement, the Subcontractor warrants that all items provided to the Contractor shall be genuine, new and unused unless otherwise specified in writing by the Contractor. Subcontractor further warrants that all items used by the Subcontractor during the performance of work at the [name DOE site here], include all genuine, original, and new components, or are otherwise suitable for the intended purpose. Furthermore, the Subcontractor shall indemnify the Contractor, its agents, and third parties for any financial loss, injury, or property damage resulting directly or indirectly from material, components, or parts that are not genuine, original, and unused, or not otherwise suitable for the intended purpose. This includes, but is not limited to, materials that are defective, suspect, or counterfeit; materials that have been provided under false pretenses; and materials or items that are materially altered, damaged, deteriorated, degraded, or result in product failure.

"Types of material, parts, and components known to have been misrepresented include (but are not limited to) fasteners; hoisting, rigging, and lifting equipment; cranes; hoists; valves; pipe and fittings; electrical equipment and devices; plate, bar, shapes, channel members, and other

heat treated materials and structural items; welding rod and electrodes; and computer memory modules. The Subcontractor's warranty also extends to labels and/or trademarks or logos affixed, or designed to be affixed, to items supplied or delivered to the Contractor. In addition, because falsification of information or documentation may constitute criminal conduct, the Contractor may reject and retain such information or items, at no cost, and identify, segregate, and report such information or activities to cognizant Department of Energy officials."

Failure of a supplier to meet a quality clause like the one above should be reported in accordance with Section 5 of this Guide.

Many items discovered at DOE/NNSA sites were procured with credit card from unapproved suppliers. Under many procurement systems, the use of credit cards offers the potential for bypassing procurement controls. The use of credit cards in no way relieves the credit card holder from prohibitions, controls, or other required authorizations that exist regarding the acquisition of certain types of goods and services. Care must be taken to assure application of procurement controls for items intended for use in safety systems and mission critical facilities, including flowdown of specifications, appropriate technical and quality requirements, and other procurement controls necessary to preclude entry of S/CIs.

4.2 INSPECTION AND ACCEPTANCE

Item/part number verification and review of certification documentation (e.g., CMTRs, C of Cs) alone are not sufficient to verify the quality of purchased items. Engineering attributes and QA criteria should also be specified and verified. Consideration should be given to the following:

- History of S/CI concerns with the item;
- Intended safety function of the item;
- Attributes required to perform the function;
- Processes that impart these attributes;
- Supplier past performance information;
- Source inspection, surveillance, assessments, or QA audit results;
- Receipt inspection and acceptance testing results;
- Special test and examination methods (e.g., chemical analysis, hardness and tensile testing); and
- Post-installation testing.

On-site stores and inventories should be periodically inspected to assure S/CIs are not present.

Large lots of received items may be sampled using the criteria of ANSI/ASQC Z1.4 [26]. If S/CIs are discovered during inspection or sampling, the nonconforming lot should be controlled and dispositioned in accordance with site procedures. Items exhibiting S/CI characteristics identified in Appendix 4 and on the DOE EH S/CI Web site should be presumed to be defective and should be rejected and processed through site nonconformance and S/CI procedures. S/CIs,

including those items lacking appropriate documentation, should be identified, documented, controlled, dispositioned, and reported as early as possible in the inspection process.

Items should be inspected by personnel who are trained to recognize S/CIs. Observations that a product appears to be an S/CI should be documented in accordance with applicable nonconformance procedures during the inspection process. Items confirmed as S/CI should be documented, reported and controlled in accordance with applicable procedures. S/CIs should not be returned to the supplier. If a suspect item is found to be acceptable (through engineering evaluation, verification testing, or the disposition process), the item may be installed or used.

Verification testing may be conducted on a sampling basis, either at the purchaser's facility or a qualified independent test laboratory. Purchased equipment that is found at any time to contain S/CIs should be withheld from installation or use pending engineering evaluation. If the evaluation determines that the S/CI has the potential to adversely affect the safe performance of the equipment, the S/CI should be replaced at the supplier's expense and the manufacturer notified. If it is determined (through engineering evaluation, verification, or disposition process) that the item conforms to specified requirements and will not create a potential safety hazard, the item may be installed or used.

When the design specifies the use of commercial-grade items in safety systems, ensure that the item will perform the intended function and will meet design requirements applicable both to the replaced item and its application. The acceptance process used by the purchaser to provide sufficient confidence that the items meet specified requirements should include inspections, tests, or analysis by the purchaser, or third-party dedicating entity, after delivery supplemented as necessary by one of the following:

- Commercial grade surveys;
- Product inspections or witness at hold points at the manufacturer's facility; and,
- Analysis of historical records for acceptable performance.
- Documentation, as applicable to the item, was received and is acceptable.

Additional guidance for verifying the acceptability of commercial grade items in safety applications may be found in ASME NQA-1 and EPRI NP-5662.

4.3 ENGINEERING INVOLVEMENT

Experience gained through the NRC has demonstrated that effective S/CI processes have these common characteristics [27, 28]:

- Engineering staff involvement in procurement and product acceptance;
- Effective supplier evaluation, source inspection, receipt inspection, and testing programs;
- Thorough, engineering-based processes for review, testing, and dedication of commercial-grade items for suitability in safety systems and mission critical facilities; and
- Engineering staff should receive training in S/CI awareness and design, prevention, and detection methods.

The objective of engineering involvement is to prevent or mitigate potential risks to public and worker safety attributable to S/CIs. Engineering should be involved in support of procurement, product inspection and acceptance testing, and the nonconformance dispositioning process, particularly when items are known to have been previously misrepresented.

The extent of engineering involvement should be commensurate with the risk and intended application of the item (i.e., graded approach). Engineering involvement is generally warranted to support procurement and product acceptance activities, when items are known to have been previously misrepresented.

Engineering involvement may include the following activities.

- Developing technical specifications. EPRI NP-5638 [29] contains information for ensuring that appropriate requirements are specified in purchase orders.

- Determining critical characteristics of purchased items that should be specified in the purchase order and selecting those characteristics to be verified during receipt inspection or prior to use.

- Determining specific verification testing requirements and methods applicable to the acceptance of products. The extent of verification testing should be based on the history of misrepresentation of the item, supplier past performance, the sample size and dollar value of the shipment, and the item's function in safety systems and mission critical facilities. In the absence of a performance-based audit, verification testing or inspection is appropriate, particularly when purchasing from suppliers who are neither the original manufacturers nor authorized distributors and for whom there is no past performance information. Verification testing may be performed during receiving inspection or post-installation inspection.

- Evaluating acceptance test results and dispositioning S/CIs.

- Reviewing technical changes to and deviations from procurement documents.

- Developing methods for use by maintenance or inspection personnel to indicate the acceptability of suspect items determined by engineering evaluation to be acceptable for use in their current application (e.g., painting heads of fasteners a distinctive color).

- Participating in audits, surveillances, and source inspections to verify the technical performance capability of suppliers of items for safety systems.

- Maintaining, modifying, or justifying the replacement of equipment involving design changes. Guidelines on engineering evaluation to justify equipment replacement are provided in EPRI NP-6406 [30].

An engineering evaluation should be conducted to determine whether a system can be operated in its present configuration without modification or replacement of S/CIs, or whether the system

must be locked out, tagged out, and removed from service immediately. Engineering evaluation results should specify any conditional use of the system and any compensatory actions that will ensure the least possible threat to public and worker safety. Results should be communicated to the local DOE/NNSA office in accordance with site procedures.

4.4 INSTALLED ITEMS

4.4.1 General

DOE O 414.1B requires DOE/NNSA and its contractors to implement QA programs with procedures for inspecting, identifying, evaluating, testing, removing, replacing, and dispositioning S/CIs installed in safety systems, non-safety systems, and critical load paths of lifting equipment and mission critical facilities. DOE M 231.1-2 further requires that all installed S/CIs, regardless of their application, be reported by means of ORPS and reported to the Office of the Inspector General (OIG). A legal and contract review of contractual provisions at the local level (affected delivery site) is strongly encouraged so that contractual duties, rights and obligations are defined.

Contractors should ensure that S/CIs dispositioned either to remain in place or to be removed later during planned or routine maintenance are clearly identified by marking or other appropriate means as determined by site procedures. Installed S/CIs that could be removed from their current acceptable applications should be marked to preclude their reuse.

If an engineering evaluation determines that an S/CI does not pose a potential safety risk or hazard and if the item can remain in place, then it should be distinctly identified or controlled by suitable means in accordance with site procedures, affected design media updated to reflect the field condition, in order to prevent issuance of an additional nonconformance report and performance of a duplicate engineering evaluation.

Note: In areas where operating temperatures are 500 F and above, or are subject to cyclic loading where fatigue failure is likely to occur, all Grades 8 and 8.2 suspect/counterfeit fasteners should be replaced prior to further use of the equipment. Additional information on fastener and other material properties and inspection and testing criteria is provided in applicable ASTM International and SAE standards.

4.4.2 Safety Systems

DOE O 414.1B requires that contractor management systems be implemented for all work commensurate with facility/activity hazards and mission impact. Contractors should establish and maintain current lists of safety systems and those facilities/activities affecting the DOE/NNSA mission. Such lists should provide a basis for establishing priorities, for conducting inspections, and for identifying and dispositioning S/CIs discovered in safety systems and mission critical facilities. All S/CIs should be documented under site nonconformance processes, appropriately dispositioned and reported by means of ORPS and to the local OIG.

An engineering evaluation should be conducted by authorized technical personnel using recognized methods and site procedures to determine where and how the S/CI is used in a safety system or mission critical facility, its potentially adverse effect on safety, and its proposed disposition. Potential hazards to workers during S/CI removal should be recognized.

If the S/CI discovered in a safety system or mission critical facility could create a potential safety hazard, an engineering evaluation should determine whether:

- The system should be removed from service immediately, locked out, and tagged out until the S/CI has been replaced with an acceptable item; or
- The system can be used, with limitations on operation, until the item can be replaced.

If an engineering evaluation determines that an S/CI does not pose a potential safety hazard, the item may remain in place, provided it is properly identified or controlled by other suitable means, according to site procedures, to prevent its reuse in an application where it may not be suitable. Sampling inspection and special inspection techniques, (e.g., portable testing equipment) may be used to locate and evaluate S/CIs installed in safety systems and mission critical facilities.

4.4.3 Non-Safety Systems

If an S/CI is discovered in a non-safety system, the following actions should be taken.

- Identify the nonconforming item through site nonconformance processes.
- Report the S/CI to the local DOE/NNSA office.
- Issue an Occurrence Report.
- Notify the local OIG.
- Mark or otherwise identify the S/CI as determined by local procedures.
- Maintain the S/CI for evidentiary purposes until no longer deemed necessary by the OIG.
- Remove, replace, and dispose of the S/CI during routine maintenance, or repair or disposition it to remain in place as determined by the disposition of the nonconformance.

S/CI discovery in a non-safety system should prompt inspection of similar items in safety systems. Also, an S/CI discovered in non-safety system applications could create personnel safety hazards, which should be treated in accordance with Section 4.4.2.

4.4.4 Critical Load Paths in Lifting Equipment

Lifting equipment, including both fixed and mobile cranes and other devices (e.g., forklifts, scissor lifts, manlifts, balers, truck and dock lifts, elevators, conveyors, and slings) have many bolted connections that rely on the integrity of the fasteners and structural components to meet specifications for safe operation. Crane and other equipment manufacturers have identified the

critical load paths for their key structural components. Examples of critical load paths for fixed cranes include the bottom and top blocks, trolley system, bolted connections on main bridge supports, bolted rod connections, and end stops.

S/CIs discovered on lifting equipment should be reported to the manufacturer, documented through site nonconformance processes, reported in ORPS, reported to the local DOE/NNSA office, and reported to the local OIG office. An engineering evaluation should be conducted to determine the critical load paths in lifting equipment based on information provided by the equipment manufacturer. If the evaluation determines that an S/CI discovered in a critical load path of lifting equipment could create a safety hazard, site or facility management should be notified and the lifting equipment locked out and tagged out or otherwise removed from service according to site procedures. The S/CI should be removed, disposed of, and replaced by an acceptable item. If the evaluation determines that the S/CI in a critical load path could not create a safety hazard in its current application, the S/CI should be identified by marking or other appropriate methods and its location noted; the S/CI should either be removed and replaced during future maintenance or repair or allowed to remain in place in accordance with Section 4.4.1.

An S/CI discovered outside the critical load path of lifting equipment should be documented through site nonconformance processes, reported in ORPS, to the local DOE/NNSA office, and to the local OIG office.

4.4.5 Capital Assets

Condition assessment survey (CAS) inspectors should verify that contractors have taken prescribed actions to control S/CIs for those facilities and equipment defined in DOE O 534.1, ACCOUNTING [31] as capital assets.

4.5 REMOVAL AND DISPOSITION

Consistent with the guidance provided above, all known S/CIs should be removed as soon as practicable from any location within the DOE complex when an engineering evaluation has determined that the S/CI could create a safety hazard. S/CI may be destroyed, provided:

- The item cannot be traced to a supplier, manufacturer, or distributor;
- Is not required as material evidence by the local OIG for litigation (See Section 6.2.8.); and
- The local OIG has authorized destruction of the item.

If authorized by the OIG, destruction of the S/CI should be performed in a manner so as to permanently and irrevocably alter the S/CI so that it cannot be used. Examples of alteration include melting, shredding, or destroying the threads on fasteners; crushing circuit breaker casings; or embedding fasteners in concrete or other media, rendering them useless. A Certification of Destruction should be obtained from the disposal source. Burying S/CIs may be acceptable if they do not contain hazardous material or material prohibited by Federal, State, or local regulations (e.g., cadmium-plated fasteners).

S/CIs should be removed from surplus safety systems and mission critical facilities before components and items are released for sale or transfer of accountability. Conversely, surplus items received from DOE/NNSA or other facilities should be inspected for S/CIs prior to acceptance and installation.

5. OCCURRENCE REPORTING AND INFORMATION EXCHANGE

5.1 REPORTING S/CI DISCOVERY

10 CFR 830, Subpart A and DOE O 414.1B require that processes for the prevention of quality problems (i.e., S/CIs) be established and implemented. The quality assurance requirements further state that items, services, and processes that do not meet requirements be identified, controlled and corrected. DOE M 231.1-1A requires prompt reporting of all S/CIs, regardless of their location/application, to the cognizant DOE operations office manager and program manager by means of ORPS, and the local OIG. The use of ORPS and the S/CI notification process (Section 5.4) will facilitate the contractor's reporting obligation. Reporting an S/CI to ORPS does not substitute for reporting to the OIG.

Prompt reporting of S/CI in ORPS contributes to improvement of safety, regulatory compliance, and reliability. The S/CI information reported in ORPS is also used by Program Offices, other DOE contractors, EH, OIG, and where appropriate by external agencies to prevent the spread of potentially hazardous items. For this reason, information reported should be sufficient to alert other organizations of an S/CI and potential safety or performance problems associated with the items. Historically, many S/CIs and defective items have been identified via ORPS. EH-3 reviews ORPS events on a daily basis for S/CI and defective items with the potential safety impact on DOE/NNSA operations (see Section 5.4).

5.2 GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM

Office of Management and Budget Policy Letter No. 91-3 [32] requires DOE to participate in the exchange of failure experience information concerning S/CI. Accordingly, DOE/NNSA and their contractors should participate in the Government-Industry Data Exchange Program (GIDEP). Information on joining and participating in GIDEP can be found at: http://www.gidep.org. The Office of Corporate Performance Assessment utilizes GIDEP as a S/CI information source. DOE/NNSA and its contractors should also use GIDEP information in their procurement, inspection, and maintenance processes to both prevent introduction of S/CI's and assist in the identification of S/CIs that have already entered the facility, and for reporting S/CI discoveries.

5.3 CONSULTATION WITH OFFICE OF GENERAL COUNSEL

Program managers should consult with DOE's Office of General Counsel regarding legal questions arising from any S/CI occurrence. Typical legal questions involving an S/CI report include disclosure restrictions; procedures to protect Government rights against S/CI suppliers; and proper liaison procedures among DOE programs and investigative, law enforcement, or prosecuting agencies (e.g., the Office of Inspector General Defense Criminal Investigative

Service, Federal Bureau of Investigation, U.S. Department of Justice, and U.S. Attorneys). Within the Office of General Counsel, the Office of Assistant General Counsel for Civilian Nuclear Programs should be consulted for SCI issues involving nuclear safety, at (202) 586-6975. For SCI issues involving procurement and contractual-related issues, the Office of Assistant General Counsel for Procurement and Financial Assistance should be consulted, at (202) 586-2440. Both offices are located at DOE Headquarters in the Forrestal Building in Washington, D.C.

5.4 S/CI REVIEW, ANALYSIS, AND NOTIFICATION

5.4.1 S/CI Review and Analysis

In May 2003, EH assumed corporate responsibility for the Department's S/CI process. This responsibility includes the collection and review of information from internal and external sources and the identification and dissemination of potential S/CI's and defective items to the DOE/NNSA complex. Figure 1 depicts a flow chart of the S/CI process. S/CI information sources include ORPS, GIDEP, Institute of Nuclear Power Operation (INPO), Noncompliance Tracking System databases, accident investigation reports, and NRC Generic Communications.

For each potential S/CI identified, EH prepares a Data Collection Sheet (DCS) and assigns a tracking number. The DCS is used to facilitate review of the S/CI or defective item and to document actions taken to resolve the issue. EH reviews DCSs with the operating experience review team. The identified S/CI and defective items are evaluated using screening criteria for applicability to DOE/NNSA and to determine what actions should be taken. EH may also obtain advice and assistance from other subject matter experts in the Department to assist them in making this determination. Typical screening criteria include:

- Is this a repeat occurrence?
- Does the issue affect more than one site or have the potential to affect more than one site?
- Has the issue been declared S/CI or defective, or does it have the potential to be declared S/CI?
- Is an investigation underway or about to be initiated regarding potential criminal activities?
- Does the issue have any immediate or potential regulatory, environmental, health, or safety impact?
- Could other organizations address the issue more appropriately?
- Does the issue have any complex-wide procurement implication?

5.4.2 S/CI Notification Process

The purpose of the S/CI notification process is to provide a coordinated mechanism for the timely dissemination and field review of information concerning potential S/CI. Based on the potential significance of the S/CI and applicability to DOE/NNSA, the information may be provided to the complex using one of several methods.

- An EH Safety Alert may be issued and posted on the DOE EH S/CI Web site
- S/CI points of contact in the field or at Headquarters may be notified
- The DCS may be posted on the DOE EH S/CI Web site
- An article may be published in the OE Summary

Regardless of how the information is disseminated, field and Headquarters organizations should review the information for potential applicability to their own facilities and operations. When an organization identifies an S/CI, it should submit an ORPS report and notify the local Inspector General (IG). The ORPS report will then be reviewed by the OE Group as part of its daily review of ORPS Reports.

If EH determines that the S/CI issue is crosscutting and/or of significant concern, it is elevated to the Assistant Secretary for Environment, Safety and Health. A support group is convened as necessary with applicable representatives from the line and the Offices of General Counsel (GC) and IG. The GC and the IG representatives will assist in dealing with sensitive (closely held) information related to ongoing investigations. No information is to be withheld from DOE and the contractor community except whether a criminal investigation is planned or ongoing or who may have made the allegation. All other pertinent S/CI information will be provided. This support group assists EH in developing lines of inquiry to investigate and disposition the S/CI. Members of the support group will be designated by their management and will have the means and authority to act on behalf of the organization. Support groups will be formed on an ad-hoc basis, and may consist of representatives from organizations such as EH (lead), IG, GC, Environmental Management (EM), NNSA, Office of Science, Fossil Energy and Nuclear Energy.

EH will then send a memorandum to the applicable PSOs describing the issue and requesting an investigation be conducted in accordance with the lines of inquiry. This memorandum will also include a request to respond to EH with a plan, schedule for completing the investigation, the results of the investigation, and the PSO evaluation of the results. The PSOs then direct their field organizations to conduct an investigation of the S/CI issue as they deem necessary. PSOs then evaluate and document the results of their investigation whether an S/CI is identified or not. If S/CI is identified, an ORPS Report is submitted per the requirements in DOE O 231.1A, and the IG notified, per the requirements dictated in DOE O 221.1. The PSOs also initiate the appropriate corrective measures to remedy the S/CI issue and collect the costs associated with this effort. The documented results of the investigation at each site, including any corrective actions, are forwarded to respective PSO who can evaluate adequacy of responses and then forward to EH.

EH then consolidates the results of the PSO reports and reviews them for completeness. EH may make recommendations to the PSOs regarding the report results. EH then forwards consolidated information such as cost data and other information to the IG or other organizations as appropriate to close out the investigation.

The EH *Process Guide for the Identification and Disposition of Suspect/Counterfeit Items at Department of Energy Facilities* [37] has been posted on the DOE EH S/CI Web site at http://www.eh.doe.gov/sci.

6. REPORTING S/CIs TO DOE OIG

6.1 AUTHORITY

DOE O 221.1 [33] requires DOE/NNSA and contractor personnel to report instances of suspected fraud, waste, and abuse to OIG. This all-encompassing requirement includes S/CIs. Reporting S/CIs pursuant to other DOE/NNSA directives (e.g., reporting into ORPS) does not substitute for reporting S/CIs to OIG.

6.2 REPORTING S/CIs TO OIG

6.2.1 General

DOE/NNSA field elements or contractors should report any S/CI discovered during receipt, maintenance, testing, inspection, or use and when there is reason to believe that a fraudulent act occurred during the manufacture, shipping, testing, or certification of the S/CI. The following are some, but not all, indicators that should cause suspicion of fraud.

- Though Item X was ordered and billed for, evidence exists that the supplier intentionally provided Item Y.
- The S/CI, sold as new, shows evidence of prior use.
- Evidence shows that the manufacturer or supplier:

  —Intentionally provided altered or incomplete testing data or

  —Did not disclose that some testing data were missing.
- Performance is inconsistent with certification or testing data furnished by the manufacturer or supplier.
- Product failure rate exceeds expectations.
- The manufacturer's name, logo, serial number, or manufacture date appear to have been altered.
- Product is certified as meeting specified criteria but fails independent QA test.

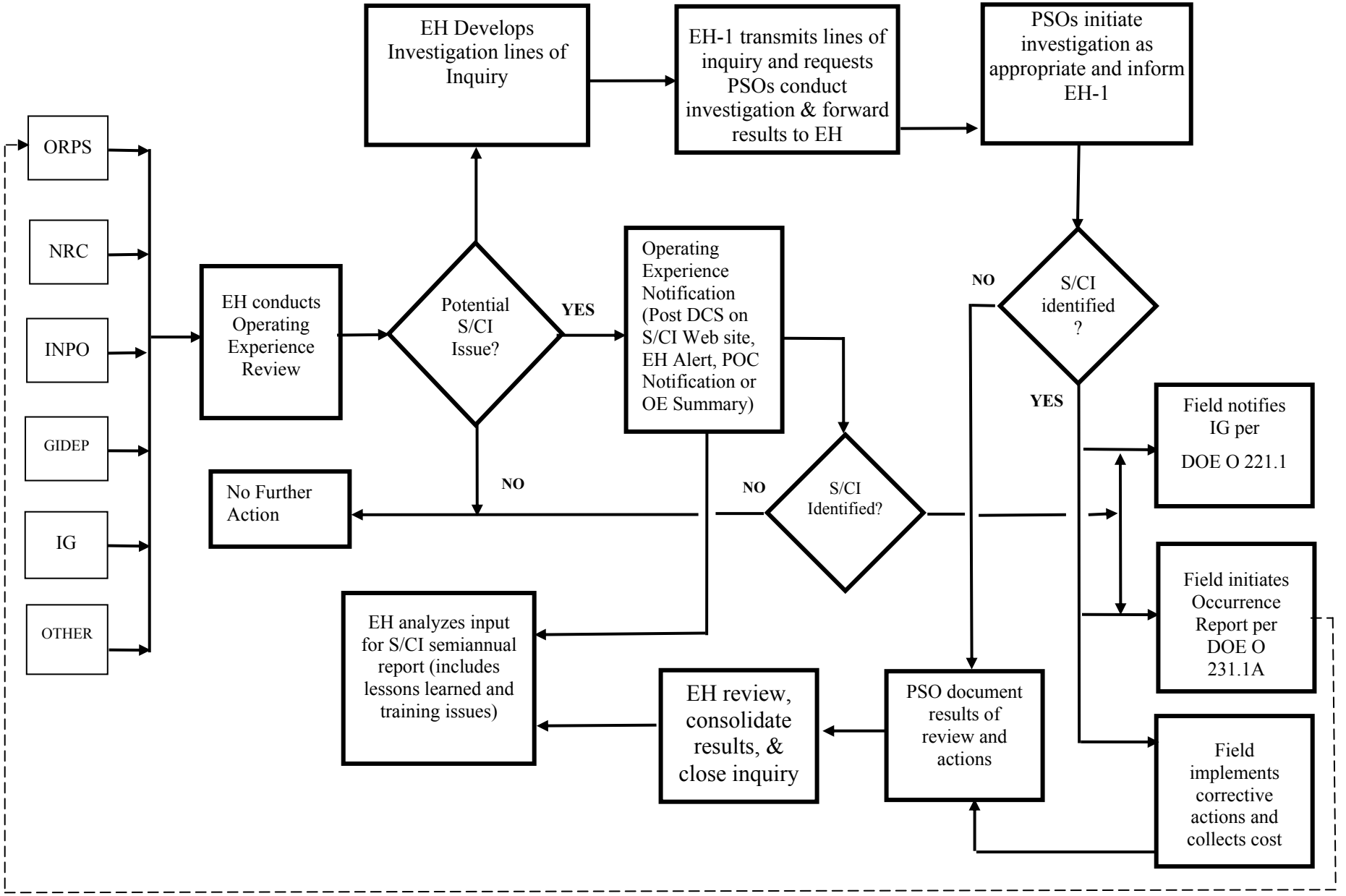

Figure 1. Suspect/Counterfeit Item Process Flow Chart

6.2.2 Who Should Report S/CIs to OIG

DOE/NNSA or its contractors at the site (i.e., location) where the S/CIs are initially discovered should report directly to OIG. Responsibility for reporting S/CIs to OIG, as described in this Guide, should be fixed at each location.

6.2.3 Where to Report

All reports to OIG should be made to the local OIG office nearest the location where the S/CIs were initially discovered. Communicating directly with the local OIG office improves the chance of successful communication of the necessary information. Appendix 3 contains the location, mailing address, telephone number, fax number, and electronic mail address of the local OIG offices.

6.2.4 What to Report

Report specific characteristics of the potential fraud including;

- Description of the S/CI (e.g., raw material, fasteners, electrical components, valves, fittings, ratchet straps);
- Location of discovery (e.g. receiving inspection, specific building and room installed)
- Name of manufacturer, distributor, and supplier;
- Identifying numbers (e.g., serial number, model number, product code);
- Point of contact for information on the location of the S/CI and documentation;
- Date of S/CI discovery;
- Occurrence report number (if available);
- Intended end use (e.g., facility construction, component or equipment assembly);
- Significance of the S/CI;
- Dollar value of the S/CI; and
- Other pertinent information, including action that is underway by the DOE/NNSA or other agencies.

6.2.5 When to Report

An S/CI that meets the broad factual situations or characteristics for reporting to OIG should be reported immediately or within 3 working days following its discovery.

6.2.6 How to Report

S/CI may be reported by letter, telephone, fax, or electronic mail to the appropriate OIG field office. (See Appendix 3.)

6.2.7 How to Secure the S/CI

S/CI and corresponding documentation should be placed on hold in a secure area until OIG has been notified and has responded to the notification and disposition directions.

6.2.8 What to Expect from OIG

Once the local OIG office has been notified, OIG will respond in writing within 10 calendar days of the notification as to its intent regarding opening an investigation. If OIG opens an investigation, DOE/NNSA and its contractors will receive a written request to cooperate with OIG by retaining and securing the S/CI and related paperwork until the investigation is completed. In some instances, OIG may take custody of the S/CI. The OIG will also require the corresponding paperwork for investigative purposes. OIG will provide written notification when an investigation has been opened. At case closing, or when the S/CI are no longer needed for evidentiary purposes, the OIG will provide written notice releasing the S/CI from hold status, with a copy to the contractor (where appropriate) for information. Once the S/CI is released from hold status, disposal of the S/CI may proceed as described in Subsection 4.5 of this Guide. If OIG does not respond as described in this paragraph, DOE/NNSA and contractor personnel should feel free to contact OIG.

If the OIG decides not to pursue a criminal investigation, the OIG will give written notice releasing the S/CI from hold status. This action should not preclude DOE/NNSA or its contractors from denying payment, returning substandard or otherwise defective items to the sender, or seeking other contractual remedies, as appropriate. OIG's decision to release an S/CI from a hold status should not be interpreted as having any bearing on the safety or usability of the product in question. Release means that the OIG does not need the items for evidentiary purposes.

> **NOTE: Returning a substandard or otherwise defective item to the sender could result in resale of that item. The purchaser should take action to ensure that either the supplier's performance is improved or the supplier is removed from the approved suppliers list.**

6.3 SUCCESSFULLY PROSECUTING S/CI CASES

The best defense against the introduction of S/CIs into the DOE/NNSA complex is a well-managed and up-to-date QA program. Prosecution of S/CI offenders is an integral part of the DOE/NNSA internal control structure and is used to discourage would-be offenders; however, prosecution without an effective QA program will not prevent the introduction of S/CIs into the DOE/NNSA complex. Implementing the following suggestions will improve the chances for successfully prosecuting an S/CI offender.

- Identify the S/CI during initial receipt at its point of entry into the DOE/NNSA complex (i.e., where the goods ordered are opened, inspected, tested (when applicable), and compared to the requisition and shipping paperwork).

- Limit and document the chain of custody of the S/CI and paperwork from receipt until OIG releases the S/CI from a hold status.
- Ensure that requisitions or purchase orders contain specific product requirements.
- Require the manufacturer and supplier to certify that the products supplied conform to contract requirements and specifications.
- Conduct an independent test (or evaluation) to show that the product does not conform to contract requirements.

7. TRAINING

S/CI training requirements should be established in DOE/NNSA and contractor training programs. DOE/NNSA and its contractors should train personnel, within their respective areas of responsibility, to identify, prevent, detect, disposition, report, and control the introduction of S/CIs into the DOE/NNSA complex. Training should include hands on training; familiarization with pertinent DOE/NNSA directives, processes, and procedures; the contents of this Guide; and site specific S/CI processes and controls.

Management personnel should be trained to gain an understanding of DOE/NNSA expectations relative to S/CI and to ensure:

- Awareness of S/CI processes, procurement and other procedures designed to preclude entry, identify, disposition, report and control S/CIs;
- Training is institutionalized and provided to appropriate personnel involved in design, procurement, inspection, nonconformance, and reporting processes receive S/CI training;
- Management systems report and evaluate all S/CIs discovered within the DOE/NNSA complex; and
- Corrective and preventive actions are institutionalized within the DOE/NNSA complex.

Supervisors should evaluate the specific training needs of their personnel to ensure that they are proficient in S/CI identification, prevention, detection, disposition, reporting, and control procedures within their areas of responsibility (i.e., engineering; procurement; environment, safety, and health; QA; receipt inspection; warehouse and storage; maintenance; operations, and incident reporting).

The target audience should include personnel who function in one or more of the following job categories: operations engineering managers and supervisors; engineers and their supervisors (facility/program/project, component, design, maintenance, new construction, or modifications); System Engineers; Quality Engineers and Inspectors; Planners and Schedulers; Project Engineers & Managers; Procurement and Supplier Quality; Drafting Leads; Facility Maintenance Supervisors; Purchase Card Holders; Crafts (fitters, welders, mechanics, carpenters, machinists, electricians, equipment operators, etc.); Construction Managers; Procurement Agents; and Occurrence Reporting.

Hands-on training should be provided during initial training for new personnel and in refresher training as necessary to demonstrate continued competence. Refresher training should be provided on a regularly scheduled basis. The purpose of refresher training is to promote awareness and encourage employee compliance with program requirements and procedures. This type of training informs employees in a timely manner of any changes to applicable requirements and procedures and motivates employees to develop and maintain awareness of changing requirements and procedures.

Sources of information for refresher training should include GIDEP; site specific, DOE and NNSA lessons learned databases; EH Alerts; ORPS; site nonconformance reports (NCRs); and hands-on training as appropriate.

Training information is also available on the DOE EH S/CI Web site at http://www.eh.doe.gov/sci.

8. ASSESSMENT AND OVERSIGHT

8.1 GENERAL

DOE/NNSA assessment requirements of 10 CFR 830, Subpart A and DOE O 414.1B apply to S/CI management and control processes and issues. DOE G 414.1-1 [34] contains guidance on performing independent and management assessment.

8.2 DOE/NNSA AND CONTRACTOR ASSESSMENT

DOE/NNSA should assess the adequacy and effectiveness of implementation of processes for review, notification, resolution of S/CI issues, and associated training, within both Federal and contractor quality assurance programs. DOE guidance G 414.1-1 contains information on independent and management assessment.

Contractors are expected to assess the adequacy and effectiveness of their S/CI controls in accordance with DOE G 414.1-1 and this Guide.

8.3 DOE INDEPENDENT OVERSIGHT AND ENFORCEMENT

The DOE Office of Independent Oversight and Performance Assurance (OA) and the OIG are responsible for conducting independent oversight of DOE/NNSA actions related to S/CI issues. In addition, the DOE Office of Enforcement and Investigation is responsible for investigating potential contractor violations of the QA rule, 10 CFR 830, Subpart A, involving S/CIs.

APPENDIX 1. DEFINITIONS

Certificate of Conformance. A document signed or otherwise authenticated by an authorized individual certifying the degree to which items or services meet specified requirements.

Certified Material Test Report (CMTR). A written and signed document that is approved by a qualified party and contains data and information that attests to the actual properties of an item and the actual results of all required tests.

Commercial Grade Item. An item that is: a) Not subject to design or specification requirements that are unique to nuclear or mission critical facilities or activities; b) Used in applications other than nuclear or mission critical facilities or activities; c) To be ordered from the manufacturer'/supplier on the basis of specifications set forth in the manufacturer's published product description (for example, a catalog).

Critical Load Path. A structural component (e.g., fastener) in a crane, hoist, transporter, or other handling or lifting equipment in load bearing applications and whose failure could result in an operational safety problem or an unacceptable risk of injury to workers or the public.

Counterfeit Item. A suspect item that has been copied or substituted without legal right or authority to do so or one whose material, performance, or characteristics are knowingly misrepresented by the vendor, supplier, distributor, or manufacturer.

Dedication. An acceptance process undertaken to provide reasonable assurance that a commercial grade item to be used in a safety system or mission essential facility meets specified requirements. This assurance is achieved by identifying the critical characteristics of the item and verifying their acceptability by inspections, tests, or analysis performed by the purchaser or third party dedicating entity after delivery, supplemented as necessary by one or more of the following: commercial grade surveys; product inspections or witness at hold points at the manufacturer's facility, and analysis of historical records for acceptable performance.

Engineering Evaluation. A technical review conducted by qualified engineering and other technical personnel using accepted methods to determine the actual or potential cause of a substantial safety hazard and the effect of an S/CI.

Nonconformance. A deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate.

Safety Margin. That margin built into the safety analyses of the facility as set forth in the authorization basis acceptance limits.

Safety System. A DOE/NNSA nuclear and nonnuclear facility structure, system, or component whose preventive or mitigative function is a major contributor to defense-in-depth (i.e., prevention of uncontrolled material release) or worker safety as determined from hazard

analysis. Also, a DOE structure, system, or component, including a primary environmental monitor or a portion of a process system, whose failure could adversely affect the environment, safety, or health of the public or workers.

Suspect/Counterfeit Item (S/CI). An item that does not conform to established requirements and exhibits one or more of the indications included in Appendix 4. Investigation of S/CIs should be performed to determine whether the indications are the result of a quality control problem or is actually fraudulent.

Suspect Item. An item, which through visual inspection, testing, or other means indicate that it does not conform to established Government or industry-accepted specifications or national consensus standards.

APPENDIX 2. REFERENCES

The following referenced documents were used in developing the information contained in this Guide. Some of these documents, such as DOE Orders and the QA Rule, may be linked to the DOE home page. Other documents, such as the ASME standards and EPRI Guidance documents, may be purchased or obtained from the sponsoring organizations. Some DOE documents, such as the 1993 S/CI Plan and related memoranda were used in developing the original Guide and have since been superseded, either totally or in part, are listed as historical references. Formal cancellation of these documents is not required because they are not part of the DOE directives system.

1. Public Law 101-592, Fastener Quality Act of 1990.

2. 15 CFR, Part 280, Fastener Quality.

3. Department of Energy (DOE) Office of the Inspector General Report, *Concerns with the Effectiveness of the Department's Quality Assurance Program Regarding Production Substitution Issues,* DOE/IG-0304, November 1991.

4. DOE Office of Environment, Safety and Health, Quality Alert Bulletin No. 92-4, August 1992.

5. DOE Office of Nuclear Energy, *Plan for the Suspect/Counterfeit Products Issue in the Department of Energy,* October 1993.

6. DOE Office of Environment, Safety and Health, *Independent Oversight Analysis of Suspect/Counterfeit Parts Within the Department of Energy,* November 1995.

7. DOE Office of Oversight, Environment, Safety and Health, INDEPENDENT OVERSIGHT REVIEW OF THE DEPARTMENT OF ENERGY QUALITY ASSURANCE PROGRAM FOR SUSPECT/COUNTERFEIT PARTS, May 1996.

8. DOE Office of Field Management, Resolution of Outstanding Issues Identified from Inspector General Report DOE/IG-0304, *Concerns with the Effectiveness of the Department's Quality Assurance Program Regarding Production Substitution Issues,* November 1991; *Report of the Senior Managers' Task Group to Resolve Outstanding Issues Concerning Suspect/Counterfeit Items in the Department of Energy,* June 1996.

9. DOE O 414.1B, *Quality Assurance,* dated 4-29-04.

10. 10 CFR 830, Subpart A, Quality Assurance Requirements.

11. DOE G 414.1-2, *Quality Assurance Guide for use with 10 CFR 830.120 and DOE O 414.1*, dated 6-17-99.

12. DOE O 231.1A, *Environment, Safety and Health Reporting,* dated 8-19-03.

13. DOE M 231.1-2, *Occurrence Reporting and Processing of Operating Information*, dated 8-19-03.

14. DOE P 450.4, *Safety Management System Policy, dated 10-15-96*

15. DOE P 450.3, *Authorizing Use of the Necessary and Sufficient Process for Standards-Based Environment, Safety and Health Management*, dated 1-25-96.

16 ASME NQA-1-2000, Quality Assurance Requirements for Nuclear Facility Applications.

17. ANSI/ISO/ASQ Q 9001-2000, Quality Management System - Requirements.

18. International Atomic Energy Agency (IAEA), *Management of Procurement Activities in a Nuclear Installation,* TECDOC-919, December 1996.

19. Electric Power Research Institute (EPRI), *Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications* (NCIG-07) EPRI/NP-5652.

20. DOE O 433.1, *Maintenance Management Program for DOE Nuclear Facilities*, dated 6-1-01

21. ASME, *Quality Assurance Program Requirements for Fastener Manufacturers and Distributors,* ASME FAP-I-1990.

22. Electric Power Research Institute (EPRI), *Guidelines for the Procurement and Receipt of Items for Nuclear Power Plants,* (NCIG-15), EPRI/NP-6629.

23. EPRI, *Guidelines for Performance-Based Supplier Audits,* (NCIG-16), EPRI/NP-6630.

24. Federal Acquisition Streamlining Act of 1994.

25. *Department of Energy Acquisition Regulation,* Acquisition Letter 95-08.

26. American National Standards Institute/American Society for Quality Control (ANSI/ASQC), *Sampling Procedures and Tables for Inspection by Attributes,* ANSI/ASQC Z1.4.

27. Nuclear Regulatory Commission (NRC), *Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products,* Generic Letter 89-02.

28. NRC, *Licensee Commercial-Grade Procurement and Dedication Programs,* Generic Letter 91-05.

29. EPRI, *Guidelines for Preparing Specifications for Nuclear Power Plants,* (NCIG-04), EPRI/NP-5638.

30. EPRI, *Guidelines for the Technical Evaluation of Replacement Items in Nuclear Power Plants,* (NCIG-11), EPRI/NP-6406.

31. DOE O 534.1, *Accounting*, dated 1-6-03

32. Office of Management and Budget, *Reporting Nonconforming Products,* Policy Letter No. 91-3.

33. DOE O 221.1, *Reporting Fraud, Waste, and Abuse to the Office of Inspector General*, dated 3-22-01.

34. DOE G 414.1-1A, *Management Assessment and Independent Assessment Guide for Use with 10 CFR, Part 830, Subpart A, and DOE O 414.1A, Quality Assurance; DOE P 450.4, Safety Management System Policy; and DOE P 450.5, Line ES&H Oversight Policy,* dated 5-31-01.

35. The Office of Independent Oversight and Performance Assurance, *Special Study of the Department of Energy's Management of Suspect/Counterfeit Items*, August 2003.

36. DOE EH Safety & Health Bulletin No. 97-6, November 1997, *DOE Quality Assurance Working Group Suspect/Counterfeit Item Advisory – Suspect/Counterfeit Stainless Steel Fasteners.*

37. EH *Process Guide for the Identification and Disposition of Suspect/Counterfeit Items at Department of Energy Facilities.*

APPENDIX 3. OFFICE OF INSPECTOR GENERAL OFFICE OF INVESTIGATIONS AT FIELD OFFICES[1]

Location/Address	Telephone	Fax	Electronic Mail Address
ALBUQUERQUE, NM[2]			
Adrian Gallegos Assistant Special Agent-in-Charge Office of Investigations Office of Inspector General U.S. Department of Energy P.O. Box 5657 Albuquerque, NM 87185	(505) 845-5570	(505) 845-4663	agallegos@doeal.gov
CHICAGO, IL[3]			
Special Agent Eric Thomas Special Agent Rochelle Valdez Office of Investigations Office of Inspector General U.S. Department of Energy 9800 South Cass Avenue, Bldg. 33 Argonne, IL 60439	(630) 252-2631 (630) 252-2170	(630) 252-7594	eric.thomas@ch.doe.gov rochelle.valdez@ch.doe.gov
DENVER, CO[4]			
Special Agent Robert Scherer Special Agent Lynn Moran Office of Investigations Office of Inspector General U.S. Department of Energy 12155 W. Alameda Parkway Lakewood, CO 80228-2802	(720) 962-7551 (720) 962-7550	(720) 962-7554	scherer@wapa.gov moran@wapa.gov

[1]Office of Investigations is divided into four primary regions: Northeast, Southeast, Northwest, and Southwest. All data are current as of December 2003. Contact the DOE Office of Investigations at 202-586-9939 for directions if you are unable to contact the above offices.
[2]Regional hub for the Southwest Region.
[3]Satellite office of the Northeast Region and reports to the Washington, DC, office.
[4]Satellite office of the Northwest Region and reports to the Richland, WA, office.

Location/Address	Telephone	Fax	Electronic Mail Address
IDAHO FALLS, ID[4]			
Special Agent Riley Proctor Special Agent Todd Jourdan Office of Investigations Office of Inspector General U.S. Department of Energy P.O. Box 51566 Idaho Falls, ID 83405-1566	(208) 526-4227 (208) 526-4225	(208) 526-4175	**proctort@id.doe.gov** **jourdatn@id.doe.gov**
LIVERMORE, CA[5]			
Special Agent Kelly Farrell Office of Investigations Office of Inspector General U.S. Department of Energy P.O. Box 2270 Livermore, CA 94551	(925) 424-4138	(925) 422-3230	**kelly.farrell@oak.doe.gov**
OAK RIDGE, TN[6]			
Walter Warren Assistant Special Agent-in-Charge Office of Investigations Office of Inspector General U.S. Department of Energy P.O. Box 62 Oak Ridge, TN 37831	(865) 576-9588	(865) 576-8111	**warrenw@oro.doe.gov**
PITTSBURGH, PA[3]			
Special Agent Thomas Shearer Special Agent Loran DeHonney Office of Investigations Office of Inspector General U.S. Department of Energy P.O. Box 10940 Pittsburgh, PA 15236-0940	(412) 386-4970 (412) 386-6185	(412) 386-4971	**tom.shearer@netl.doe.gov** **loran.dehonney@netl.doe.gov**

[5]Satellite office of the Southwest Region and reports to the Albuquerque, NM, office.
[6]Regional hub for the Southeast Region.

Location/Address	Telephone	Fax	Electronic Mail Address
RICHLAND, WA[7]			
Special Agent Patrick McGlinn Special Agent Karrisa Otero Assistant Special Agent-in-Charge Office of Investigations Office of Inspector General U.S. Department of Energy P.O. Box 754 Richland, WA 99352	(509) 376-8533 (509) 376-0349	(509) 376-7458	**patrick_d_mcglinn@rl.gov** **karrisa_otero@rl.gov**
SAVANNAH RIVER, SC[8]			
Special Agent Kevin Childress Office of Investigations Office of Inspector General U.S. Department of Energy P.O. Box 447 New Ellington, SC 29809	(803) 725-7319	(803) 725-5384	**kevin.childress@srs.gov**
WASHINGTON, D.C.[9]			
Yvette Milam Special Agent-in-Charge Office of Investigations Office of Inspector General U.S. Department of Energy 1000 Independence Ave SW Room 8F-037 Washington, D.C. 20585	(202) 586-3084	(202) 586-5697	**yvette.milam@hq.doe.gov**

[7]Regional hub for the Northwest Region.
[8]Satellite office of the Southeast Region and reports to the Oak Ridge, TN, office.
[9]Primary regional office for the Northeast Region.

APPENDIX 4. SUSPECT/COUNTERFEIT ITEM INDICATORS

Note: This appendix presents an example of S/CI indicators. Please refer to the DOE EH S/CI Web site at http://www.eh.doe.gov/sci/ for a complete listing of current indicators.

1. Indicators for Identifying Suspect/Counterfeit Items

1.1 General Indicators

- Items may be suspect or fraudulent when:
- Nameplates, labels or tags have been altered, photocopied, silk- screened, or painted over; are not secured well; are unusual in location; show incomplete data; or are missing. Preprinted labels will normally show typed entries.
- Item has wear marks or scratches on external surfaces
- Obvious attempts at beautification have been made, such as excess painting or wire brushing; evidence of hand painting (touch-up); stainless steel is painted; non-ferrous metals (e.g., copper, brass, bronze) are clean and bright indicating recent polishing.
- Handmade parts are evident, such as gaskets are rough-cut, shims and thin metal part edges show evidence of cutting or dressing by hand tools (filing, hacksaw marking, use of tin snips or nippers).
- Hand tool marks exist on fasteners or other assembly parts (upset metal exists on screw or bolt head) or dissimilar parts are evident (seven of eight bolts are of the same type, one is of a different type).
- Poor fit between assembled items.
- Metallic items are pitted or corroded.
- Casting markings have been ground off and item has been re-stamped with other markings.
- Configuration is not consistent with other items from the same supplier or varies from that indicated in supplier literature or drawings.
- Inconsistency between vendor name on the item and on the shipping container.

- Nameplates attached with inconsistent fasteners, such as screws instead of rivets or rivets and screws.
- Nameplates attached in a different location than normal.
- Nameplates that appear old or worn, with paint on them, and look newer than the component.
- Nameplates missing manufactures standard markings, stamps, or logos and with irregular stamping or inconsistent type style.
- Difference appearances of items in the same shipment.
- Unusual boxing and packaging of item. Packaging inconsistent with supplier's normal packaging or documentation requirements.
- Price if the item is offered at unusually low price.
- Unusual disclaimers or denials of responsibility for the accuracy of test results, etc.
- Supplier is not a factory-authorized supplier.
- Dimensions of the item are inconsistent with the specification requested on the purchase order and those provided by the supplier at the time of shipment.
- Item or component matches the description of one that is listed on a suspect item list (e.g., DOE Suspect Fastener Headmark List).

2. Documents

2.1 Documentation may be suspect or fraudulent when:

- The use of correction fluid or correction tape is evident. Type style, size or pitch change is evident.
- The document is not signed, initialed when required, is excessively faded or unclear (indicating multiple, sequential copying) or data is missing.
- The name of the document approver or his title cannot be determined; the document has missing (or illegible) signature, initial, or data; or the approval name and approval signature do not match.
- Technical data is inconsistent with Code or standard requirements (e.g., no impact test results are provided when impact testing is required or CMTR physical test data indicates no heat treatment and heat treatment is

required; chemical analysis indicates one item, physical tests indicate another).

- Certification or test results are identical between items when normal variations should be expected.
- Document traceability is not clear. The documentation should be traceable to the items procured.
- Documentation is not delivered as required on the purchase order or is in an unusual format.
- Document is excessively faded, photocopied, or unclear
- Corrections are not properly lined-out, initialed and dated.
- Handwritten entries are on the same document where there is typed or preprinted data
- Text on page ends abruptly and number of pages conflicts with transmittal.
- Inconsistent configuration between product and product literature.
- Lines on forms are bent, broken, or interrupted indicating data has been deleted or exchanged by "cut and paste"
- Data on a single line is located at different heights
- Product recall
- No or incomplete documentation.

3. Visual Manufacturing Quality

3.1 An item may be suspect or fraudulent when it exhibits the following:

- Poor fit between assembled items.
- Configuration is not consistent with other items from the same supplier or varies from that indicated in the supplier literature or drawing.
- Increased dimensions.
- Evidence of previous bolt head scoring on backsides of flanges or evidence that the area has been ground.
- Loose or missing fasteners.

- Evidence of marring, tool impressions, traces of prussian blue or lapping compound, or other evidence of previous attempts at fit-up.
- Heat discoloration is evident.
- Dissimilar items carelessly in contact.
- Poor cleanliness of item.

4. Product Specific indicators

4.1 Surplus or Rebuilt Valves

Paint

- Valve appears freshly painted and valve stem has paint on it
- Wear marks or scratches on any painted surface
- Valve stem is protected, but protection has paint on it
- Paint does not match standard original equipment manufacturers (OEM) color
- Exterior evidence of attempted repairs (i.e., brush marks to repair spray paint)
- Inconsistent shades on painted surfaces.

Valve Tags

- Tags attached with screws instead of rivets
- Tags attached in a different location than normal
- Tags that appear old or worn
- Tags with paint on them
- Tags that look newer than the valve
- Tags with no part numbers
- Tags with irregular stamping
- Tags without manufacturing logos.

Handwheels

- Old looking handwheel on new looking valves

- Handwheels that look sandblasted or newer than the valve
- Different types of handwheel on valves of the same manufacturer.

Bolts/Nuts

- Bolts/nuts have a used appearance (excessive wrench marks on flats)
- Improper bolt/nut material (e.g., a bronze nut on a stainless stem)
- Bolts with different size or grade markings.

Valve Body

- Ground off casting marks with other markings stamped in area, OEM markings are nearly always raised, not stamped
- Signs of weld repairs
- Incorrect dimensions
- Fresh sand-blasted appearance including eyebolts, grease fittings, stem, etc.
- Evidence of previous bolt head scoring on backsides of flanges, or evidence that this area has been ground to remove such marks
- On a stainless valve, a finish that is unusually shiny indicates bead blasting. A finish that is unusually dull indicates sand-blasting. The finish on a new valve is in-between.

Manufacturer's Logo

- Missing
- Logo plate looks newer than valve
- Logo plate shows signs of discoloration from previous use.

Other

- Foreign material inside valve (e.g., metal shavings)
- Valve stem packing which shows that all the adjustments have been run out
- In gate valves, a gate that is off-center when checked through the open end of the valve
- Obvious differences between valves in the same shipment.

4.2 Fasteners

- Head markings are marred, missing, or appear to have been altered.
- Threads show evidence of dressing or wear (threads should be of uniform color and finish).
- Head markings are inconsistent within a heat number.
- Mixed grade or manufactures head marks in same lot or shipment.

4.3 Electrical Devices

- Connections show evidence of previous attachment (metal upset or marring).
- Connections show arcing or discoloration.
- Fasteners are loose, missing or show metal upset.
- Molded case circuit breakers are not consistent with manufacturer provided checklists for detecting substandard/fraudulent breakers.
- Missing UL or other labels.
- Rivets are missing and screws are used in place of where rivets are normally used or rivets look to be reused.
- Molded case circuit breakers are shiny or look to have been painted with a lacquer.

Molded-Case Circuit Breakers (MCCBs)
Investigations thus far of electrical components at DOE/NNSA facilities uncovered over 700-suspect/counterfeit MCCBs that were previously used, refurbished and sold to DOE/NNSA contractors. The quality and safety of refurbished MCCBs is questionable since they are not designed to be taken apart and serviced or refurbished. There are no electrical standards established by Underwriters Laboratories Inc. (UL) for the refurbishing of MCCBs, nor are there any "authorized" refurbishers of MCCBs. Therefore, "refurbished" MCCBs should not be accepted for use in any DOE/NNSA facility unless specifically authorized.

One source of refurbished MCCBs is in the demolition of old buildings. Some refurbishers are junk dealers who may change the amperage labels on the MCCBs to conform to the amperage ordered and then merely clean up and shine them.

The Nuclear Regulatory Commission (NRC) had been informed of MCCB refurbishing and in early 1988, a sales representative identified "refurbished"

MCCBs at Diablo Canyon Nuclear Power Plant. A subsequent investigation confirmed that MCCBs sold to the utility as new equipment were actually refurbished. The managers of the two firms that refurbished and sold these MCCB were convicted of fraud and paid a substantial fine.

The NRC published information Notice No. 88-46 dated July 8, 1988, reporting the investigation findings and circulated it to all applicable government agencies, including DOE. On July 20, 1988, DOE notified all field offices that refurbished MCCBs might have been installed in critical systems. Shortly thereafter, DOE established the Suspect Equipment Notification System (SENS), a submodule of ES&H Events and News on the Safety Performance Measurement System (SPMS). SENS has since been replaced by the supplier Evaluation and Suspect Equipment (SESE) submodule that includes Suspect Equipment Reports.
Some of the older DOE/NNSA sites have MCCBs in use that are no longer manufactured. Examples of these, according to the Nuclear Management and Resources Council (NUMARC), are Westinghouse breakers with frames E, EA, F and FA. If a DOE/NNSA contractor has an application requiring a MCCB with one of these frame sizes, it could not be purchased from Westinghouse. To acquire these MCCBs, the Westinghouse dealer would need to turn to the secondary or refurbished market. Dealing with an authorized distributor also does not preclude receipt of refurbished MCCBs.

The solution is not to focus on the credentials of the distributor but on the traceability of the MCCB. A purchaser can be assured of having a new MCCB only if it is traceable to the original manufacturer.

Refurbishers have been known to interpret “new and unused” as a MCCB they have rebuilt and supply them as meeting requirements for “new and unused”. Purchasers should assure that terminology included in procurement documents is clearly understood.

Indicators of Refurbished Breakers
Typically, refurbished MCCBs sold as new have one or more of the following characteristics.

- The style is no longer manufactured.
- Packaging is often inexpensive (cheap) and generic instead of in the manufacturers’ original boxes.
- Refurbished MCCBs are often bulk-packaged in plastic or brown paper bags, or in cardboard boxes with handwritten labels. New circuit MCCBs are packed individually in boxes with the manufacturer’s label, usually in color, and are often date stamped.

- The original manufacturer's labels and/or the Underwriters Laboratories Inc. (UL) or Factory Mutual (FM) labels may have been counterfeited or removed from the MCCB. Refurbishing operations have been known to use copying machines to produce poor quality copies of the original manufacturer's and the certifying body's labels.

- MCCBs may be labeled with the refurbisher's name rather than the label of a known manufacturer.

- The manufacturer's seal (often multicolored) across the two halves of the case of the MCCB is broken or missing.

- Wire lugs (connectors) show evidence of tampering.

- The surface of the MCCB may be nicked or scratched yet have a high gloss. Refurbishers often coat them with clear plastic to produce a high gloss that gives the casual observer the impression that it is new. The plastic case of new MCCBs often has a dull appearance.

- Some rivets may have been removed, and the case may be held together by wood screws, metal screws, or nuts and fasteners.

- Contradictory amperage ratings may appear on different parts of the same refurbished MCCB. On a new MCCB, the amperage rating is stamped into, raised from, or machine-painted on the handle. In order to supply a MCCB with a hard-to-find rating, refurbishers have been known to file the surface of the handle to remove the original rating and hand-paint the desired amperage rating.

Testing

In a news release dated February 6, 1989, the National Electrical Manufacturers Association (NEMA) announced cancellation of its Publication AB-2-1984 entitled, "Procedures for Field Inspection and Performance Verification of Molded-Case Circuit Breakers used in Commercial and Industrial Applications," and stated the following:

> *"These procedures were intended for use with breakers that had been originally tested and calibrated in accordance with NEMA Standards Publication AB 1 or Underwriters Laboratories Standard UL 489, and not subsequently opened, cleaned or modified...Therefore the Standards Publication contained none of the destructive test procedures...necessary to verify the product's ability to withstand such conditions as full voltage overload or short circuit. Without such tests, even if a rebuilt breaker had passed the tests specified in AB-2, there would be no assurance that it would not fail under overload or short circuit conditions. It is NEMA's*

position that regardless of the results of electrical testing, refurbished electrical circuit breakers are not reliable and should not be used."

Precautions
The following precautions should be followed regarding suspect or refurbished MCCBs.

- Procurement documents should require MCCBs to be new and unaltered. Proof that they are new and unaltered requires the supplier to demonstrate traceability through the supply chain back to the original manufacturer.
- Reliance on authorized distributors alone from purchasing refurbished MCCBs should be avoided. Purchasers should augment the use of authorized distributors with other methods of supply chain verification.
- Formal approved procedures, incorporating the indicators in this Guide, should be used to inspect MCCBs upon receipt and at installation.
- The original manufacturer should be contacted if any indication of misrepresentation is encountered. There are many original manufacturers of MCCBs whose products are being refurbished and sold as new. These manufacturers have the most specific information about how to assure that their products have not been refurbished.

Disposition
MCCBs discovered exhibiting indications that they may be refurbished should be segregated and controlled in accordance with governing nonconformance-reporting procedures. Retention is necessary for potential use as evidence by the Office of Inspector General (OIG). The OIG should provide notification if retention is no longer necessary. Suspect MCCBs may only be disposed of following notification by the OIG that they are no longer needed as evidence. All suspect electrical components must be reported in the ORPS. The ORPS categorization group should be identified as "Cross-Category items, Potential Concerns of issues." The description of cause section in the ORPS report should included the text "suspect counterfeit items." Destruction of all S/CI should be witnessed and documented.

4.5 Rotating Machinery and Valve Internal Parts Indications include the following.

- Shows marring, tool impressions, wear marks, traces of Prussian blue or lapping compound or other evidence of previous attempts at fit-up or assembly.
- Heat discoloration is evident.
- Evidence of erosion, corrosion, wire-drawing or "dimples" (inverted cone-shaped impressions) on valve discs or seats or pump impellers.

5. Piping and Piping Components (Including Mechanical and Metal Products)

5.1 Components with the following indications are considered suspect, unless otherwise noted.

General Indications for Piping and Piping Components

- Used component appearance
- Unusual or inadequate packaging
- Foreign newspapers used as packaging
- Scratches on component outer surface
- Evidence of tampering on body, screws, tags, or nameplates
- Components with no markings
- Pitting or corrosion
- External weld or heat indications
- Questionable or meaningless numbers
- Typed labels
- Evidence of hand made parts
- Painted stainless steel, freshly painted parts, mismatched colors
- Ferrous metals that are clean and bright
- Excess wire brushing or painting
- Ground off casting marks with stamped marks in the vicinity
- Signs of weld repairs
- Threads showing evidence of wear or dressing
- Inconsistency between labels
- Old or worn nameplates
- Nameplates which look newer than the component
- Missing manufacturer’s standard markings and logos

- Traces of Prussian Blue
- Markings not legible
- Evidence of re-stamping
- No specification number
- No size designation
- Missing pressure class rating
- Disclaimers on certifications that disclaim any obligation or liability for non-conformances or specification failure of items to conform to the state specification.

5.2 Specific Indications for Pipe, Tube and Flanges:

- No specification number
- No size designation
- Missing pressure class rating
- Other missing designations per the specification.

5.3 General Valve Indications:

- Wrench marks on valve packing glands, nuts, and bolts
- Nameplates attached with screws rather than rivets
- Poor fit between assembled valve parts
- Internals dirty or show signs of rework (e.g., lapping compound, Prussian Blue)
- Scratched or marred fasteners or packing glands
- Gate valve: gate off-center when viewed through open end
- Fresh sand blasted appearance of valve bodies, eyebolts, fittings, stems, etc.
- Loose or missing fasteners
- Different types of handwheels are on valves of the same manufacturer

- Some parts (e.g., handwheels) look newer than the rest of the valve
- Improper materials (e.g., bronze nut on a stainless stem)
- Post-manufacturing alteration to identification/rating markings
- Indication of Previous Joint Welding.

6. Electrical Components

Components with the following indications are considered suspect.

6.1 General Indications

- Screwdriver marks on terminals
- Different screw types or items on terminals
- Handwritten or typed rather than stamped tags
- Missing, incorrect, or altered labels/tags (usually UL approval tag)
- Pitted or worn contacts and lugs
- Not in manufacturer's box or container
- Signs of paint or smoke
- Insufficient nameplate information
- Missing terminals
- Screws used in place of rivets
- Body worn or discolored
- Rough metal edges
- Scratched or marred surfaces
- Metal color inconsistencies
- Modified or re-stamped nameplates
- Improper fastening of nameplates
- Plastic parts of different colors

- Discolored or faded manufacturer's labels
- Past due calibration stickers (internal and external)
- Broken or damaged solder terminations
- Broken or damaged termination lugs
- Contact surfaces that do not mate properly
- Lubrication which appears to be old
- Electrical leads of incorrect length per OEM literature
- Shipping in plain packaging (no manufacturer bar code).

6.2 Specific indications

Molded Case Circuit Breakers

- Handle modified to change Ampere rating
- Style is no longer manufactured
- Unusual packaging: bulk packaging, generic packages, and "cheap" appearance
- Refurbisher's name on breaker
- Broken seal between halves, screw sealing material upset/missing
- Case held together with incorrect fasteners (e.g., rivets replaced with screws/bolts)
- Missing date code on body
- Contradicting amperage ratings.

Fuses

- Label missing or weathered
- Wear marks on bases.

Power (Draw Out) Circuit Breakers

- Different color or shape of over current devices
- Suspicious looking auxiliary trip devices.

Motor Starters

- Poor fitting or wrong voltage rated operating coil

Motor Control Centers

- Breakers that are not easily opened or closed when compartment door is closed
- Exposed busswork with compartment doors open

Electro-mechanical Relays

- Poor or loose fitting relays

Potter-Brumfield Relay

- Sloppy coil lead-solder joints
- Painted relay base grommets (normally clear)
- Terminal strips fastened with eyelets
- Painted rivets fastening the terminal strip to the relay housing
- Termination screws in brown paper bags (should be in clear, heat-sealed plastic bags)
- Use of bubble wrap (plastic with styrofoam should be used)
- Repainted inner bell surface
- Missing or inconsistent date codes, inspection stamp, and test stamp
- Incorrect shaft relay cover clearance, shaft play, and lack of bearing lubricant
- Tops of rotor shafts painted a color other than black
- Nonuniform numbers stamped on the contact decks, indicating decks made up from various relays
- Incorrect coil (i.e., 125 VDC relay with 200 VDC coil)

Capacitors

- Polished surfaces scratched or dented
- Termination lugs scarred
- Buildup of debris and dirt in termination guards
- Plain packaging (no manufacturer bar codes)

7. Fasteners

7.1 General Indications

- No manufacturer's or grade mark (unless certified to a specification not requiring marking)
- Double stamping evidence of machining marks
- Poor thread form, evidence of wear, evidence of dressing
- Head marks shown on the Suspect Fastener Head Mark List
- Foreign manufacturer not meeting Public Law 101-592
- No markings for nuts or washers packaged with labels indicating that they were manufactured to a code or MIL·SPEC that requires marking
- Head markings are marred, missing, or appear to have been altered
- Head markings are inconsistent with a heat/lot
- Metric and SAE stamping
- Evidence of machining marks
- Double stamping.

7.2 Specific Information Regarding High Strength Fasteners

General Background

Counterfeit fasteners have been found in military and commercial aircraft, surface ships, submarines, nuclear weapon production facilities, bridges, buildings, and the space shuttle. These fasteners often do not possess the capabilities of the genuine fasteners they counterfeit and can threaten the reliability of industrial and consumer products, National Security, or lives. At Congressional hearings in 1987, the Army testified that they had purchased fasteners that bore the headmarks of Grade 8 high-strength fasteners, but that were an actually inferior Grade 8.2 fastener.

The International Fasteners Institute (IFI) reported finding substandard, mismarked, and/or counterfeit high-strength Grade 8 fasteners in the United States commercial marketplace. In 1988, IFI reported that counterfeit medium-strength Grade 5 fasteners had also been found. Foreign fasteners dominate the American marketplace due to their price advantage, and the majority of suspect/counterfeit fasteners are imported. Identifying, testing, and replacing these fasteners has proven expensive and difficult, both

mechanically and technically. Not finding and replacing these fasteners, however, has proven fatal in some instances.

Headmarks

The Suspect Fastener Headmark List (Appendix 5) may be removed and photocopied as needed for use as a poster and reference to known suspect fastener headmarks. Fasteners with the headmarks shown have a significant likelihood of not meeting standards. Generally, the cost of replacement of these fasteners is less than the cost of chemical, hardness, and tensile strength testing. Note also that counterfeit fasteners can be delivered with counterfeit certificates. Documentation alone is insufficient to demonstrate compliance with standards.

The Fastener Quality Act of 1990 requires the registration of the headmarks of manufacturers, and it also will require everyone in the distribution chain to ensure fastener traceability.

Consensus Standards

Several consensus organizations have published standards for the properties of fasteners. One of these is the Society of Automotive Engineers (SAE). The SAE grade (or alleged grade on a suspect item) of a fastener is indicated by raised or indented radial lines on the head, as shown on the Suspect Fastener Headmark List. The DOE/NNSA is concerned with two different grades of fasteners: Grade 5, which has three equally spaced radial lines on the head of the fastener; and Grade 8, which has six equally spaced radial lines. Letters or symbols on the head indicate the manufacturer.

The Suspect Fastener Headmark List (Appendix 5) was prepared by the United States Customs Service after extensive testing of many samples of fasteners from around the United States. The headmarks on this list are those of manufacturers that have often been found to have sold fasteners that did not meet the indicated consensus standards. Sufficient testing has been done on the fasteners on this list to presume them defective without further testing. Any fastener, anywhere in the DOE community, in stock, in bins, or installed with a headmark on the Suspect Fastener Headmark List should be considered suspect/counterfeit.

Precautions: Selective Testing

Some facilities (i.e., manufacturers, distributors) perform selective testing of sample fasteners rather than have an independent testing laboratory run all the tests required by consensus standards. In many cases, a new counterfeit fastener has roughly the same physical strength as the graded fastener it mimics, but does not have either the chemical composition or the heat treatment specified by the consensus standards. As a result, it will stretch, exhibit metal fatigue, or corrode under less harsh service than the genuine fastener. Simple tensile strength tests cannot be used to identify substandard

high-strength fasteners and should not be solely relied upon in performing acceptance test.

Using Suspect/Counterfeit Grade 5 Fasteners in Grade 2 Applications

Some sites use suspect/counterfeit Grade 5 fasteners in applications that only call for Grade 2 fasteners. Eventually, the suspect/counterfeit Grade 5 fasteners may find its way into an application that requires a genuine Grade 5 fastener and that application may fail. In some cases, cheap imported graded fasteners have been purchased in place of upgraded fasteners because the small price differential made the extra quality seem to be a bargain. Given the expense of removing suspect fasteners from DOE facilities, the practice of using suspect fasteners for any application should be discontinued.

Keep Fasteners in Original Packages

All fasteners purchased should be kept in the original packages, not emptied into bins. The packages should have labels or other markings that would permit them to be associated with a particular procurement action and a specific vendor. Approved supplier lists should be checked to assure that fastener suppliers on that list have been recently evaluated for adequacy of their quality programs.

APPENDIX 5. SUSPECT/COUNTERFEIT HEADMARK LIST

Headmark List

All Grade 5 and Grade 8 Fasteners of Foreign Origin Which Do Not Bear Any Manufacturers' Headmarks:

 Grade 5  Grade 8

Grade 5 Fasteners with the Following Manufacturers' Headmarks:

MARK	MANUFACTURER	MARK	MANUFACTURER
 J	Jinn Her (TW)	 KS	Kosaka Kogyo (JP)

Grade 8 Fasteners with the Following Manufacturers' Headmarks:

MARK	MANUFACTURER	MARK	MANUFACTURER
 A	Asahi Mfg (JP)	 KS	Kosaka Kogyo (JP)
 NF	Nippon Fasteners (JP)	 RT	Takai Ltd (JP)
 H	Hinomoto Metal (JP)	 FM	Fastener Co of Japan (JP)
 M	Minamida Sieybo (JP)	 KY	Kyoei Mfg (JP)
 MS	Minato Kogyo (JP)	 J	Jinn Her (TW)
 Hollow Triangle	Infasco (CA TW JP YU) (Greater than 1/2 inch dia)		
 E	Dalei (JP)	 UNY	Unytite (JP)

Grade 8.2 Fasteners with the Following Manufacturers' Headmarks:

MARK	MANUFACTURER
 KS	Kosaka Kogyo (JP)

Grade A325 Fasteners (Bennet Denver Target Only) with the Following Headmarks:

	MARK	MANUFACTURER
Type 1 	A325 KS	Kosaka Kogyo (JP)
Type 2 		
Type 3