HRP Job Aid

Especially Designed or Prepared (EDP)

EDP: A Brief History

By the mid-1960s, five countries had successfully developed and tested nuclear weapons. In an effort to stem the tide of increasing proliferation, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) entered into force in 1970. Among other things, the NPT sought to control the international trade of equipment or material that was "especially designed or prepared" (EDP) for the processing, use, or production of special fissionable material (i.e., material that is uniquely capable of powering a nuclear reactor or fueling a nuclear weapon). However, the NPT's high level definition of EDP equipment and material was not useful for establishing national laws on export controls.

To address this gap, the Nuclear Suppliers Group (NSG) was formed in 1978 and is a group of 48 countries seeking to promote nuclear nonproliferation. It publishes guidelines called the "Trigger List" for the control of nuclear transfers and exports. These guidelines provide more detailed definitions of what constitutes EDP equipment and material, with the aim of supporting the establishment of national export controls laws. However, these definitions are illustrative, meaning that they generally relate to equipment functionality (e.g., equipment capable of fabricating reactor fuel) rather than providing specific design or operating parameters of control (e.g., magnesium of a specific purity).

Identifying EDP Items

There is not a clear, concise definition or list of EDP equipment. The concept of EDP is designed to capture especially designed *or* especially prepared items (not especially designed *and* especially prepared) related to the nuclear fuel cycle.

- EDP criteria not only cover uniquely nuclear items but also covers items that are not unique but especially prepared for certain nuclear end uses.
- EDP includes items that are made-to-order, adapted, or modified to enable them to process, use, or produce special nuclear material.
- Features that make an item EDP include size, performance characteristics, construction materials (e.g., high corrosion resistance), or a combination of these characteristics.

The NSG Trigger List's Annex B is an illustrative list and is not inclusive or definitive.

- Some items cannot be listed due to classification and/or technology security reasons.
- Updates to negotiated export control lists often lag behind technological developments and advancements.
- **If a piece of equipment or system fits the functional purpose described in the Trigger List, it may still be considered EDP, and therefore, effectively a Trigger List item.**

Some EDP items may include certifications and visible markings such as an American Society of Mechanical Engineers (ASME) N stamp.

An N stamp symbolizes the fact that the item (pump, valve, pressure vessel, etc.) to which the stamp is affixed has been manufactured in accordance with the stringent requirements of Section III of the ASME Boiler and Pressure Vessel Code.

Section III of the Boiler and Pressure Vessel Code contains standards for nuclear equipment and facilities, and it applies to the following phases of the design and manufacturing process of these EDP items:

- Materials
- Quality control (e.g., welding requirements, chemical and physical test certifications, documentation and traceability)
- Testing
- Final inspection
- Auditing

An off-the-shelf item from a vendor's catalog may be EDP when it meets requirements and specifications from a customer for a specific nuclear application. In some situations, subcomponents of larger EDP equipment or systems are EDP items. When making an EDP determination, it is important to ask *EDP for what?*

If it is not especially designed or prepared for the processing, use, or production of special fissionable material, it is not covered by the Trigger List.

Example

A trash can designed to fit in a special corner of a reactor building might be especially designed, but it is still just a trash can. It has no part in the processing, use, or production of special fissionable material and is not covered by the Trigger List

Regulations Governing EDP Equipment

The NSG Trigger List governs the export of items that are especially designed or prepared for nuclear use. The list includes (i) nuclear material; (ii) nuclear reactors and associated equipment; (iii) non-nuclear material for reactors; (iv) plants and equipment for the reprocessing, enrichment, and conversion of nuclear material and for fuel fabrication and heavy water production; and technology (including software) associated with each of the above items.

The NSG Trigger List does *not* cover the following items:

- Tritium
- Tritium production equipment
- Lithium enriched in ^{6}Li
- Lithium isotope separation equipment
- Weaponization components (e.g., detonators, firing sets, switching devices [krytrons, sprytrons, triggered spark gaps], neutron generators)

However, the U.S. Nuclear Regulatory Commission (NRC) licenses the export of Trigger List items and material, as authorized in 10 CFR Part 110. In that regulation, the United States placed additional material, equipment, and systems under the NRC's licensing authority as if these had been listed on the NSG Trigger List. An example is lithium isotope separation equipment.

Two Examples of EDP Equipment

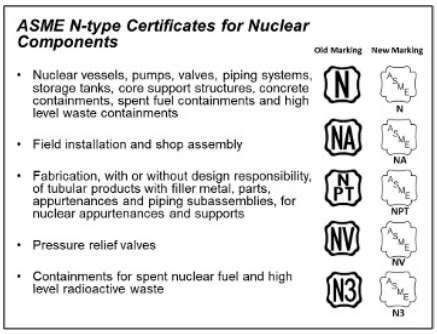
Example 1 is a dual-use valve that has been modified to fit in a uranium enrichment flow cascade. As purchased from the manufacturer, this valve could be used in many non-nuclear applications. But, the modifications shown make it useful only to this specific uranium enrichment application. Therefore, the modified, dual-use valve is an EDP item. Example 2 shows how the nuclear N stamp is used to identify EDP equipment. The use of the N stamp is restricted to EDP equipment.

Example 1: A dual-use valve modified in house

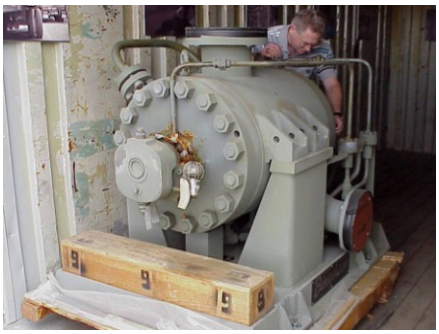
Standard Hoke valve (not modified).

Hoke valve "especially prepared" for UF_6 service.

Example 2: N Stamps



Visual indicators of EDP found on nuclear equipment.



An N stamp on a nameplate affixed to a pump EDP for nuclear reactor service. The nameplate also lists the pump manufacturer, serial number, date of manufacture, design temperature, and casing design pressure.

Crate of EDP valves for reactor service with attached N stamp nameplates.

This N stamp nameplate is attached to the side of the EDP pump.

DOE/NNSA High Risk Property

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