CHAPTER 12

NAVAL NUCLEAR PROPULSION INFORMATION

A. General Information

This chapter provides guidance for determining if historical records, containing DOE NSI, pertaining to Naval Nuclear Propulsion Information (NNPI) are to be declassified or have their classification retained beyond 25 years in accordance with the provisions of E.O. 12958. ***Documents containing RD and FRD are not addressed by this document and retain present classification.***

NNPI is all information, classified or unclassified, concerning the design, arrangement, development, manufacture, testing, operation, administration, training, maintenance and repair of the propulsion plants of naval nuclear-powered ships and prototypes, including the associated shipboard and shore-based nuclear support facilities.

Classified NNPI falls into one of two categories: RD or NSI, as follows:

NNPI is RD *if it relates to the use of* special nuclear material in the production of energy in the reactor plant of nuclear powered ships and prototypes. Documents containing RD are not subject to automatic declassification under provisions of the AEA. (Refer to appendix A.)

NNPI is NSI if it pertains primarily to the remainder of a nuclear propulsion plant other than the reactor, as well as to militarily significant information regarding support facilities and information relating to the conduct of foreign affairs of the Federal Government.

Unclassified Naval Nuclear Propulsion Information (U-NNPI), although unclassified, is subject to special handling, access, marking requirements, and distribution controls (i.e., export control). Appendix C contains a listing of information considered to be U-NNPI. All documents containing or believed to contain U-NNPI shall be referred to the Naval Reactors Office for their consideration.

B. Broad Guidance

NNPI is classified to prevent unauthorized access to information which could assist other nations in the development of nuclear powered naval vessels. This consideration is key to determining what information must be protected. It is also the intent to prevent unauthorized access to significant information related to the tactical characteristics and capabilities of a naval ship or naval reactor design information which would be of value to other nations. Also, NNPI is classified to enable the U.S. Navy to operate in foreign waters without compromising sovereignty or fleet operational information. Nuclear powered warships are present in foreign waters and ports of over fifty nations and U.S. dependencies. The acceptance of these vessels into foreign ports is based on the assurance that the same safe procedures and practices followed in U.S. ports are followed elsewhere. The classification guidance topics provided below identify classified NNPI that is exempt from automatic declassification. For more specific topics and further detailed classification guidance, reviewers shall refer to the current version of CG-RN-1, *DOE/DoD Classification Guide for the Naval Nuclear Propulsion Program* (U).

Historical records containing potential DOE NSI, pertaining to NNPI not covered by the specific guidance below must be coordinated with the Naval Reactors Office to determine if they are classified RD or may contain U-NNPI (sensitive, unclassified information that has controls similar to UCNI). NSI marked documents

covered by "U" topics must also be coordinated with the Naval Reactors Office for potential U-NNPI. This does not include records containing information classified by statute such as RD and FRD (AEA of 1954, as amended). These records shall be handled, protected, classified, downgraded, and declassified in accordance with the provisions of the AEA and regulations issued under that Act. Reviewers who are not authorized by DOE/NNSA to classify or declassify such documents should not attempt final determinations. Refer to appendix A for information on identifying and handling documents containing potential RD/FRD. In all cases where there is a question concerning the sensitivity of the information, it should be referred to the DOE HQ classification office for a classification determination.

Topics describing information likely to contain or closely related to RD or FRD are marked "(potential for RD/FRD)".

C. Topics

12.0 NAVAL NUCLEAR PROPULSION INFORMATION

NOTE: **All Naval Nuclear Propulsion Information must be referred to CNO/NNSA Deputy Administrator for Naval Reactors for declassification review. The declassification event for the topics in this chapter occurs when the information has been officially released by the CNO/NNSA Deputy Administrator for Naval Reactors.**

12.1 General

12.1.1 Technical objectives of a nuclear propulsion project	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.1.2 The identification of the core design features that will be tested	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.1.3 Identification of specific alternate technologies being studied now or in the past	**U**
12.1.4 Details of results of alternate technology studies	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.1.4.1 The fact that the Naval Nuclear Propulsion Program is studying or has studied methods to predict or control gaseous hydrogen buildup under accident conditions in order to understand the use of those methods in the commercial nuclear power industry	**U**
12.1.5 Information on personnel health and safety matters not involving specific naval nuclear propulsion plant components, equipment, or systems	**U**
12.1.6 Information on regulatory or environmental matters not involving specific naval nuclear propulsion plant components, equipment, or systems	**U**
12.1.7 Information on release of hazardous materials that requires reporting under Federal or State statutes or regulations	**U**
12.1.8 Information about onsite environmental conditions not involving specific naval nuclear propulsion plant components, equipment, or systems	**U**

12.1.9 Information or reports which identify a problem with, or in, specific naval nuclear propulsion plant components, equipment, or systems, or the corrective actions for that problem	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.1.10 Compilations of information or reports which reveal military sensitive types of problems involving a naval nuclear propulsion plant components, equipment, systems, or materials	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.1.11 Procedures for refueling, initial core installation, or reactor maintenance	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.1.11.1 The fact that steel, lead, tungsten alloys, and depleted uranium are or will be used to provide shielding in reactor servicing equipment	**U**
12.1.11.2 The fact that borated stainless steel or borated aluminum has been or may be used in irradiated fuel transfer containers or irradiated fuel shipping containers	**U**
12.1.11.3 The fact that borated materials may have been used in water pit holding racks or in cell disassembly stands	**U**
12.1.11.4 The fact that continuously operating criticality monitors are required during new or irradiated fuel handling operations	**U**
12.2 Ship design and performance	
12.2.1 Phrase "greater than 25 knots" (or any lesser speed such as "greater than 20 knots") when applied to speed of submarines	**U**
12.2.2 Phrase "greater than 30 knots" (or any lesser speed) when applied to speed of surface ships	**U**
12.2.3 Reference to speeds greater than those in topics 12.2.1 or 12.2.2 above	**Retain Classification [25X2, 4, 6, 9; EV]**

12.2.4 Maximum, design or actual shaft horsepower or any shaft horsepower associated with a particular shaft rpm, for submarines	**Retain Classification [25X2, 4, 6, 9; EV]**
12.2.4.1 Maximum, design or actual shaft horsepower or any shaft horsepower associated with a particular shaft rpm, for surface ships	**U**
12.2.5 Ship tactical characteristics. For example: depths greater than 800 ft., times for ship turning, time for zero to maximum speed, time for maximum to zero speed, diving time, surface time	**Retain Classification [25X2, 4, 6, 9; EV]**
12.2.5.1 Reference to depths less than 800 ft, including phrase "greater than 400 ft"	**U**
12.2.5.2 Length, beam, draft, and displacement of ships	**U**
12.2.6 Propulsion plant design, layout	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.3 Ship/propulsion plant shock/vibration	
12.3.1 Propulsion plant noise and ship silencing data and results	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.3.1.1 The fact that the Naval Nuclear Propulsion Program is investigating high damping materials	**U**
12.3.1.2 General or fundamental theory or experiments on noise sources, transmission, reduction procedure and underwater sound radiation	**U**
12.3.2 Shipboard shock test data and results (including components)	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**

12.3.3 Test results of ship, components or systems	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.3.4 Ship vibration data and test results	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4 Naval reactor core	
12.4.1 General statement to the effect that a naval reactor is a pressurized water reactor	**U**
12.4.1.1 The fact that pressurized water is used as a moderator and coolant	**U**
12.4.2 Core design and operating features	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4.2.1 Core designs and operating features that have been officially released by the Naval Reactors Office	**U**
12.4.2.2 Unirradiated physical, mechanical, thermal, metallurgical and chemical properties, corrosion kinetics or corrosion properties, phase diagrams, heat treatment effects, or composition of Zircaloy-2, (Zr-2), Zircaloy-3 (Zr-3), or Zircaloy-4 (Zr-4) cladding materials and hafnium	**U**
12.4.2.3 Fundamental metallurgy or corrosion studies for broad composition ranges of Zircaloy or hafnium material	**U**
12.4.2.4 For in-pile test specimens and test assemblies, the use of the phrases "test specimen" and "test assembly" and identification by specimen number, test number, and/or assembly number	**U**
12.4.2.5 General studies of brittle fracture phenomena	**U**
12.4.2.6 The term "poison element" without a specific reference to the element content or function	**U**

12.4.2.7 The terms: element or module, fuel element or module, poison element or module, test element or module, and test coupon or specimen	U
12.4.2.8 The term "Modified Hydraulic Core" (MHC)	U
12.4.3 Core power/lifetime	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4.3.1 General identification of the life of core in years (including "life of ship")	U
12.4.3.2 The fact that a long-lived core is being studied	U
12.4.3.3 The fact that a long-lived core is being investigated or planned for a specific ship	U
12.4.3.4 The fact that the long-lived core will last for the planned life of the ship and the statement that the number of refuelings for a life-of-the-ship core equals zero	U
12.4.4 Details of core design/operation	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4.4.1 The terms "evasion mode," "battle mode," "stretch capability," or "special operating mode" and the fact that those modes are being or have been implemented on any project in the Naval Nuclear Propulsion Program	U
12.4.5 Core temperatures, pressures, fluxes, other parameters	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4.6 The fact that uranium, boron (including boron stainless steel or B_4C), zirconium, Zircaloy, aluminum, tin, chromium, stainless steel, hafnium, nickel, or combination thereof are used in cores	U

12.4.7 Identification of specific materials used as fuel, poison, or control element materials	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4.7.1 The fuel enrichment (percentage of U^{235})	**U**
12.4.7.2 The fact that hafnium is used as a control rod material	**U**
12.4.7.3 The fact that Zircaloy-2 (Zr-2), Zircaloy-3 (Zr-3), and Zircaloy-4 (Zr-4) has been used in naval reactors (specific use or core not identified)	**U**
12.4.7.4 The fact that advanced cladding material is being investigated provided the material is not identified	**U**
12.4.8 Naval fuel manufacturing process technology and product characteristic	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4.9 Reactor core manufacture information	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4.9.1 The fact that the techniques used to manufacture or form a naval nuclear fuel element are unlike those used for commercial nuclear fuel rods	**U**
12.4.9.2 Cost of special nuclear material provided the quantities of enriched uranium allocated to entire naval cores or its subunits can not be directly or indirectly determined	**U**
12.4.9.3 Linkage of core type, contract number or contractor	**U**
12.4.9.4 The fact that cores are stored at a core manufacturing facility	**U**
12.4.9.5 The throughput at Nuclear Fuel Services, including total quantity of receipts and shipments of uranium-235 (U^{235}), provided the quantity of U^{235} in a reactor core is not revealed	**U**

12.4.10 Core structurals manufacture information	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.4.10.1 Core structural parts such as shear locks, pins, bolts, nuts, locking devices, and other small parts that do not reveal core design features	**U**
12.4.11 Shipping dates of Category 1 quantities of SNM	**Retain Classification [25X2, 4, 6, 9; EV]**
12.5 Materials and metallurgy	
12.5.1 Description of experimental techniques and identification of equipment used in metallurgical studies	**U**
12.5.2 Details of results of tests associated with naval applications	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.5.3 List of acceptable materials for specific applications	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.5.4 Techniques and equipment used to determine properties and behavior	**U**
12.5.5 General or fundamental theory or experiments on welding	**U**
12.6 Reactor physics (theoretical and design information)	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.6.1 Neutron energy class (thermal, etc.)	**U**

12.7 Radiological control and shielding	
12.7.1 Details of radiological control and shielding design, fabrication, and installation associated with naval nuclear propulsion plants	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.7.1.1 The fact that borated stainless steel or borated aluminum has or may be used in irradiated fuel shipping containers	**U**
12.7.1.2 The fact that steel, lead, water, oil, or plastic are used for shielding on naval nuclear powered ships	**U**
12.7.2 Radiation survey results associated with naval nuclear propulsion plants	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.7.2.1 Radiation warning signs and barriers	**U**
12.7.2.2 Radiation survey results and radioactivity levels (e.g., curies) of shipping containers containing a packaged reactor plant component including expended cores	**U**
12.7.3 General area radiation levels not associated with a specific plant location, but which are required for incorporation into personnel medical records	**U**
12.7.3.1 Radiation exposure data of an individual	**U**
12.8 Chemistry and radiochemistry (results of tests, limits, specific chemicals used), including chemical cleaning and decontamination	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.8.1 Fact that a particular plant/ship is being considered for or will be "chemically decontaminated"	**U**
12.9 Primary plant design, instrumentation, diagrams, controls, components, problems, description, limits, operation, details, performance history, and equipment specifications	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**

12.9.1	The fact that pressurized water is used for reactor coolant	U
12.9.2	Generic components and drawings (Generic components are those which are not associated with a specific reactor plant, reactor plant parameter, or reactor function. Examples are electrical piece parts, motors, circuit breakers, relays, power supply circuits, amplifiers, and bistables.)	U
12.9.3	Use of letter-number-letter designator to identify a reactor plant project (e.g., S5W, A1G)	U
12.9.4	The fact that a KAPL-designed core will be or is installed in a Bettis-designed reactor plant or vice versa	U
12.9.5	The fact that a reactor core designed for a surface ship is being considered for or is installed in a submarine or vice versa	U
12.9.6	The reactor core designator [e.g., D2W, AFR (Advanced Fleet Reactor)] when associated with a reactor plant design (e.g., S6G, S6W)	U
12.9.7	The association of ion exchangers with the purification system of the reactor plant	U
12.9.8	The association of radioactive drain collecting tank, radioactive waste disposal tank or radioactive waste hold tank, and covered bilge well with the primary plant	U
12.9.9	Contractors' or subcontractors' capabilities or capacities for manufacturing nuclear propulsion plant components	U
12.9.10	Shop drawings which do not reveal reactor information or final assembly information	U
12.9.11	The term "Engineered Safety Features"	U
12.10	Secondary plant, including steam and electrical systems	
12.10.1	Secondary plant; design, description, diagrams, drawings, manuals, instrumentation, equipment specifications, limits, operation, and details including noise performance history	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.10.1.1	General mechanical, physical, metallurgical, corrosion, and weldability properties of materials	U

12.10.1.2 CVN68 (USS NIMITZ) class carriers' high voltage electrical equipment: the voltage rating is 4160 volts; the output power ratings of the ship service turbine generator, the coolant pump power turbine generator, and the 15 cps motor generator; the power transformer ratings; and the electrical nameplate ratings and the connecting cables	U
12.10.1.3 The fact that chemical cleaning or high pressure water jet cleaning is used for steam generators in the Naval Nuclear Propulsion Program or is planned or being performed in a specific ship	U
12.10.1.4 The term "water brake"	U
12.10.2 Development of turbine electric drive for nuclear propulsion	U
12.11 Propulsion plant operation and test including test procedures, instructions, specifications, and analyses or evaluations of primary, secondary, or overall plant	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12 12 Analysis of naval reactors	
12.12.1 General mathematics theory, equations, and general analytical techniques	U
12.12.2 Design and analysis procedures specifically developed for naval reactors plants	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.12.3 Information revealing details of reactor or plant safety studies	**Retain Classification (potential for RD/FRD) [25X2, 4, 6, 9; EV]**
12.12.3.1 The mere existence of systems of periodic examinations known as Reactor Safeguards (Safety) Examinations (RSE), Operational Reactor Safeguards (Safety) Examinations (ORSE), Post-Overhaul Reactor Safeguards (Safety) Examinations (PORSE), and Radiological Control Practices Evaluations (RCPE)	U
12.13 Radiation exposure data of an individual	U