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ANNEX 1 BACKGROUND NOTES ON TOPICS PROPOSED AS FIRST STEPS

A. Nuclear Weapons Management

o Roles and Responsibilites of DoD, DOE, Nuclear Weapons Council

U.S. nuclear weapons are in the custody of either DoD or DOE. The Atomic Energy Act, as amended, includes a dual agency responsibility for conducting the nuclear weapons program in such a way that the public's health and safety are protected. Both Departments take steps to assure nuclear weapons safety at all stages of a weapon's lifetime.

Each Department has its own safety process. The safety processes contain provisions for review and oversight to guarantee that safety matters are not subordinated to operational issues. Some parts are conducted separately; others are conducted jointly. DoD and DOE safety standards are used to evaluate all weapons systems and weapons respectively. These standards have many similarities. The Nuclear Weapons Council is a high level, joint body that advises the two Secretaries on nuclear weapons matters, with safety as a primary concern.

The purpose of this topic would be to inform the Soviets of how our safety system works, what factors are considered, how operational and safety conflicts are addressed and resolved, how restrictive procedures are invoked to compensate for design shortfalls, and what requirements exist for continued review of weapons and weapons systems to assure safety. In return, the Soviets would describe their process. Strengths, weaknesses, similarities and differences in the structuring of the respective processes could be discussed.

o Key Surety Groups/Committees

The intent here is to discuss in detail how the U.S. weapon safety process is implemented. The process involves several safety groups. Their functions include: (1) developing the safety requirements in a weapon's design; (2) certifying that the weapon design satisfies the safety requirements; (3) providing safety rules for all operations including testing, assembly, disassembly, transportation, maintenance, and fielding; (4) continual review of the safety rules and their application to assure maximum safety consistent with operational requirements; (5) evaluating the efficacy of current safety policies and identifying policy needs; and (6) general oversight of the safety process.

The desired return from the Soviets is the same as above.

o Primary U.S. Guidance on Nuclear Weapon Safety and Security

The proposal is to explain the DoD and DOE safety standards that provide for nuclear detonation safety, plutonium dispersal safety (DOE only), use control, and adequate security. The safety of every weapon (DOE) and weapon system (DoD) is evaluated against the appropriate set of standards, i.e., DoD or DOE. In some cases, quantitative criteria

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exist to support the standards; these would also be explained. The key safety groups mentioned above use these standards in their evaluations of weapon safety.

The desired return from the Soviets is the same as above.

B. Safe Storage and Transportation

o General Transport and Handling Safety Policies and Criteria

The U.S. has expended great effort to create a system of standards and criteria, with associated safety evaluations, to maximize transportation, handling and storage safety for nuclear weapons in the custody of either DoD or DOE. The proposed information exchanges can provide needed information about each side's safety standards, design philosophies, evaluation and risk assessment methodologies, and emergency preparedness.

Unclassified topics for discussion include: general security philosophy (i.e., the layered approach); organizational structure and responsibilities for transportation and storage; standards with associated qualitative/quantitative criteria; design guidance for storage sites, vehicles and related equipment; risk assessment and safety compliance evaluation methods; definition and evaluation of hazards and threats; and emergency preparedness.

For example, orders exist that regulate the methods of transportation both within and outside of the U.S., the quantity of weapons or amount of material per shipment, the length of storage at specific sites and the configuration of the weapon during storage time, other systems and materials that can or cannot be stored with nuclear weapons, and methods to evaluate the risks associated with shipments or storage. A specific example is the different transportation requirements for nuclear weapons with conventional versus insensitive high explosives.

o Methods of Transportation (helicopter, fixed wing aircraft, ship, rail, ground)

Helicopter transport of nuclear weapons is generally used in the European Theater to minimize accessibility to terrorist threat. The Air Force and Army transport nuclear weapons to and from the U.S. and overseas bases by fixed wing aircraft, while the Navy transports by ship. We no longer use rail transport of weapons. Ground transport via Safe Secure Trailers (SSTs) is used between DOE locations and between DOE and DoD locations. Transport between DoD locations within the U.S. is generally by fixed-wing aircraft or by ground vehicles. The general rules for transport modes are all flexible, and are applied on a case-by-case basis.

The U.S. has had 32 accidents to date involving nuclear weapons. Most of these occurred during transport of some kind, the general details of these incidents are unclassified, and they provide valuable lessons. We will likely withhold an exchange of accident histories until later discussions, but there are several timely efforts focused on evaluation of transportation risks and on accident modeling and mitigation techniques. One such evaluation is the DoD/DOE Transportation Safety

Study Group work, which analyzed ground nuclear weapon movements in Europe. The techniques used in such assessments, as well as the general insights, are possible areas for valuable exchange.

General areas of discussion include: transportation "ownership" and decisionmaking structure; safety standards and criteria; risk assessment methodologies and results; stockpile-to-target environments that are considered normal as well as those abnormal environments that are considered credible; emergency preparedness; related support equipment and tiedowns; accident mitigation philosophies and equipment; testing and evaluation of shipping containers; and safe vehicle design features and procedures.

o Training Requirements and Personnel Assurance Program

The selection, training and evaluation of personnel who have access to nuclear weapons is of paramount importance to both safety and security. The U.S. criteria for selection, training, evaluation and requalification of personnel having access to nuclear weapons or associated components are spelled out in such documents as DOE Order 5610.13, which is unclassified.

The U.S. could describe its techniques for evaluating personnel for nuclear weapon access, program evaluation standards and responsibilities, personnel training and requalification programs, two-man control strategy, and other general personnel assurance program information.

The gain of such an exchange would be twofold: (1) allow for mutual understanding of each side's practices, which could increase mutual confidence; and (2) provide ideas that could improve Soviet safety and security practices in this area.

o Storage Safety

As both sides begin to draw down the weapons that are on active alert, safe and secure storage becomes even more important than ever. Weapons will be placed in storage for future deployment or storage for disassembly and destruction, or they will be disassembled and the weapon components will be stored for future use in another system.

Information of primary interest relates to safe storage configurations, criteria for limits on hazardous materials in storage locations, regulations and criteria on location and design of storage sites, safety evaluation programs, environmental safety and health concerns, accident mitigation techniques, environmental threat definition and quantitative standards, and consequence modeling.

C. Safety and Safety Features

o Safety Risk Assessment Methodology as Used by DOE

DOE safety policy was changed recently to reorient the safety program to be based on risk assessment. Risk assessment includes identification of accident scenarios, accident consequences, and steps to reduce the risk of an adverse consequence. The purpose is to

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provide a more useful tool to decision makers so that it will be clear what risks are associated with given operations, what the primary contributors to that risk are, where additional positive safety measures could be most effective, and what safety benefit is obtained for a given cost and operational impact. In this manner, the safety evaluation is made more quantitative and objective and less qualitative and subjective.

A risk assessment-based program permits the establishment of meaningful criteria for determining what constitutes acceptable risk. It is the intent of DOE to use such an approach, where feasible, in all aspects of the weapons safety process. For example, when the NESSG evaluates an operation in the future, the goal is to provide it with a risk assessment for analysis. Before approving an operation, decision makers will also have access to the assessment and the NESSG-developed safety rules and will be able to judge whether the primary risks are being addressed satisfactorily.

This methodology was incorporated by the Nuclear Regulatory Commission for reactor applications, particularly after Three Mile Island. The broad application to nuclear weapons safety is new and still evolving. The Soviets may not be aware of the role risk assessment plays in the U.S. program and its value in identifying risks and specifying which are the relatively high risks requiring attention and mitigation.

o Safety Assurance Provided by Modern Weapons Safety Features

Weapons safety features are designed to prevent inadvertent or accidental nuclear detonation or dispersal of radioactive materials such as plutonium. One point safety and modern electrical safety systems provide a predictably safe weapon response in accidents, e.g., fires. Insensitive high explosives and fire resistant pits are plutonium dispersal safety features.

The purpose of this topic would be to explain to the Soviets, in a generic fashion, what these features provide, how they are tested to assure reliability, and their role in weapon performance. The discussion should also include compensating, restrictive procedures (e.g., prohibition of air transport) that are taken for weapons that do not have these features.

In return, information should be sought on Soviet safety design philosophy and design features, testing and design assurance measures, and compensating procedures for weapons with safety design shortfalls. This discussion could lay the groundwork for possible follow-on talks on advanced safety design features.

o Environmental Impact Statement/Environmental Assessment Process at DOE Facilities

This discussion would complement the weapons risk assessment talks, demonstrating how the weapons program is conducted in an environmentally responsible manner. The relative depth of EIS vs EA could be explained, along with the methodology used, what factors are

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considered, what constitutes adequate protection for the environment, the role of public and local government input, and how remedial actions are determined.

There is very little the U.S. is likely to gain from the Soviets in this area, but discussions could give them ideas for addressing their own environmental concerns.

ANNEX 2 SAFETY AND SECURITY GUIDANCE

The primary U.S. guidance on nuclear weapon safety (and security) are the four DoD nuclear weapon system safety standards from DoD Directive 3150.2 (1984). These are:

1. There shall be positive measures to prevent nuclear weapons involved in accidents or incidents, or jettisoned weapons, from producing a nuclear yield.

2. There shall be positive measures to prevent DELIBERATE prearming, arming, launching, firing, or releasing of nuclear weapons, except upon execution of emergency war orders or when directed by competent authority.

3. There shall be positive measures to prevent INADVERTENT prearming, arming, launching, firing, or releasing of nuclear weapons in all normal and credible abnormal environments.

4. There shall be positive measures to ensure adequate security of nuclear weapons, pursuant to DoD Directive 5210.41 (sent under separate cover).

Additionally, the DOE has a fifth safety standard for which there is no direct DoD parallel:

5. There shall be positive measures to prevent accidental, inadvertent, or deliberate unauthorized dispersal of plutonium to the environment.

(The term "positive measures to prevent" is accomplished by design features, safety or security devices, or procedures that exist solely or principally to provide nuclear safety and security. The phrase does not mean "absolute assurance against," however, maximum safety and security consistent with operational requirements must be provided.)