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Headquarters

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TASK GROUP 7.1

Joint Task Force Seven

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Commander
Joint Task Force SEVEN
Washington 25, D. C.

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Attention: Col. H. R. Fleming:

SUBJECT: Safety Annex Prepared for JTF 7 - OPERATION REDWING (u)

This discussion concerns the safety problems associated with the shipping of components which may offer some hazard in connection with Redwing requirements.

Sanitized by NN-523
on 2/5/98

CURTISS

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW	
1. REVIEW DATE: 10-2-97	DETERMINATION (CIRCLE NUMBER(S))
AUTHORITY: EAC/CA/DC/CA/DO	1. CLASSIFICATION RETAINED
NAME: [Signature]	2. CLASSIFICATION CHANGED TO:
2ND REVIEW DATE: 6-27-97	3. CONTAINS NO INFO CLASSIFIED INFO
AUTHORITY: ADD	4. COORDINATE WITH:
NAME: [Signature]	5. CLASSIFICATION CANCELLED
	6. CLASSIFIED INFO BRACKETED
	7. OTHER (SPECIFY):

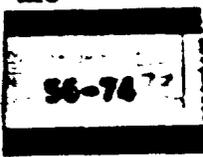
The Redwing shipments allocated for surface transportation via the Curtiss are highly diversified, extraordinarily expensive, and may present complex hazards under violently untoward circumstances.

However, the presence of a technically qualified scientist along with the shipment will do more to prepare for emergencies than any speculative procedures and expensive emergency equipment, purchased especially for the job, could contribute. It should be pointed out that everything included in the Curtiss shipment has been handled before on test operations, although this is probably the most complex shipment yet made.

Tritium

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Tritium, a radioactive isotope of hydrogen, is combustible, highly toxic and quite expensive. It's combustible properties offer no problem since the amount of tritium as a volume of gas is so small that its chemical energy may be neglected. The value of the tritium, in excess of one million dollars, calls for more than the usual amount of care in the protection of the containers and their contents and in consideration being given to salvage.

Tritium must be considered as a highly toxic element because of its radioactivity. However, it is carried in cases which, while not yet proven in stockpile experience, have been subjected to careful engineering and testing. The tritium will be carried at high pressure (thousands of pounds) in small stainless steel bottles which have been designed to a strength of four times the actual pressure and have been tested to an excess pressure of at least 50%. These smaller containers are carried inside

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of larger containers which are, themselves, pressure sealed and tested to withstand the lower pressure that would accumulate in the larger container if the smaller container should leak out of all its contents. Furthermore, the larger container is provided with a pressure gauge which will be checked periodically to see if there has been a leak in the inner container. Portable monitoring devices will, from time to time, be used to monitor for the presence of even negligible amounts of tritium; the storage area of the Curtiss will be constantly monitored.

Aside from the required careful handling of tritium containers and the periodic monitoring control that will be carried on, it is probably more significant to assure that tritium containers are not exposed to combustible environment. It is certain that the design of the present containers are such that they can safely withstand an increase in temperature of something like 300°F. However, exposure to any fire of any size for a reasonable length of time will most certainly affect the safety of the contents. An incipient fire around these containers may be fought by standard fire control techniques. A large fire, detected late, that would affect the tritium containers would require that damage control personnel be provided with full-face rescue breathing apparatus.

Nuclear Material Containers

There will be two containers carrying standard fissionable components. These may be considered inert except when involved in a large-scale fire. Incipient fires may be fought by standard fire control techniques; in a large-scale fire, detected late, damage control personnel should wear respiratory protection (full-face assault masks or better) and work from upwind. The high value of these containers indicate more than usual care in their handling and consideration for salvage.

Detonators

Spare detonators will be carried in suitcase-like containers. The explosive material in these detonators is small in amount and has substantially less sensitivity than is met with in military or commercial detonators. The nature of the components and of their packaging is such that the loss of one detonator by explosion will not propagate others. The only realistic possibility of accident involving detonators is an environmental fire. Such a fire may be fought by standard fire control procedures.

Lithium Hydride

The total weight of lithium hydride (or similar material) to be shipped is substantially less than has been carried aboard the Curtiss on a previous operation. All this material will be packaged in sealed containers. Although lithium hydride is water sensitive in that it reacts with moisture to evolve hydrogen, the packaging is considered to be so reliable that any fire in the environment of this storage may be fought with the standard fire fighting techniques. In the absence of water lithium hydride burns at a rate slower than wood.

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Since this shipment of lithium hydride will be shipped proximate to high explosives, which high explosives can offer to the environment far greater risk in case of fire than can the lithium hydride even if the hydride is affected by water, it appears most prudent to control the fire involving the high explosives by the accepted emergency techniques for controlling a conflagration around and involving military-type high explosives. Any compartment which is storing substantial quantities of lithium hydride should be provided with reasonable ventilation, something like a couple of air changes per hour.

Deuterium

There will be a small amount of deuterium carried aboard the Curtiss in standard, small-size, high pressure bottles. ~~DELETED~~ ~~DELETED~~

~~DELETED~~ This amount is so small and the high-pressure gas bottles (commercial type) are so reliable that the risk of this shipment may be neglected.

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Deep Freeze

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~~DELETED~~ These components will be monitored by the technical courier. It is considered that the weight of components is so small and the reliability of their carrying cases so well established that the risk may be neglected. The only realistic problem is one of a fire in the environment and such a fire may be fought at any stage by standard fire fighting techniques. The value of these components is large and salvage desirable.

High Explosives

The total weight of high explosives to be shipped is 2250 pounds. Although some of the explosive components will be shipped with the detonators installed, it is believed that this will not significantly increase the chance of explosions in case of fire around the high explosive components. Of further significance, however, is the fact that some of the explosives will be shipped intimate with nuclear components.

Fires in the environment surround the storage of the high explosive components should be fought vigorously and quickly.

While such a conflagration or an explosion that may follow will not be accompanied by any nuclear yield, nevertheless, the problem of contamination of the immediate shop and possibly the entire ship may be so great that the ship will be rendered unsuitable for habitation until extraordinary decontamination procedures are undertaken.

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Tritium

All tritium shipments will be accompanied by scientific personnel, qualified and equipped for monitoring. The design of the tritium containers is such that special ventilation is not required.

It is not believed that the presence of tritium aboard an aircraft should in any way affect the usual measures employed in aircraft emergencies.

Standard fire-fighting and rescue techniques may be employed by airfield damage control personnel. Crews should work from upwind. The high value of tritium makes salvage desirable.

Lithium Hydride

Lithium hydride (or hydride-like pieces) will be carried aboard aircraft in sealed containers. The reliability of the packaging and the low combustibility of this material (it burns more slowly than wood) indicate there is no significant risk as an aircraft cargo.

Of course lithium hydride is water sensitive, liberating large quantities of hydrogen when allowed to come in contact with water. However, in any serious mishap at an airfield there is no reason why emergency crews cannot use standard fire-fighting techniques, particularly for salvage and rescue work. Any hydrogen generated out-of-doors would dissipate rapidly and even if the hydrogen did ignite its energy contribution to a serious aircraft fire would be modest compared to the aircraft fuel.

Nuclear Material Containers

These may be considered inert except when involved in a large-scale fire. Aboard an aircraft, incipient fire may be fought by standard fire control techniques. In a major untoward incident that may occur on a takeoff or landing, the airfield damage control personnel should wear respiratory protection (full-face assault masks or better) and work from upwind. The high value of these containers indicate more than usual care in their handling and consideration for salvage.

Detonators

See paragraph above, in discussion of Curtiss shipment, dealing with these components.

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High Explosives

Although some of the explosive components will be shipped with the detonators installed, it is believed that this will not significantly increase the chance of explosion in case of fire around the high explosive components.

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It has been established that any explosion involving HE components assembled with fissionable material will not result in any nuclear yield. However, the general area contamination will be serious and may result in requiring isolation of the area where the incident occurred until strenuous decontamination measures have been taken.

Roy Reider

Roy Reider
Safety Officer
Task Group 7.1

RR:rcr

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