

# SUBJECT AREA CONTENT

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<b>Management System: <a href="#">Hazardous Material Transportation Safety</a></b>			
<b>Subject Area: Movement by Vehicle of Hazardous and Radiological Materials On-site</b>			
<b><a href="#">VIEW/PRINT ALL (No Exhibits and Forms)</a></b>			
Effective Date: <b>Jun 15, 2016</b> ( <a href="#">Rev 5.1</a> ) Periodic Review Due: <b>Jun 15, 2019</b>	Subject Matter Expert: <a href="#">Michael Clancy Jr</a>	Management System Executive: <a href="#">Jason Remien</a>	Management System Steward: <a href="#">Gail Mattson</a>

## Introduction

This subject area covers the step-by-step process that BNL staff and non-BNL staff must follow to package and move by vehicle hazardous and radiological materials (hazmat) between BNL facilities on-site. For the purpose of this subject area a vehicle includes any type of machine that is powered by an engine or motor. This subject area is designed to ensure that all hazmat required to be moved by vehicle on-site will be properly packaged, labeled, and handled to ensure the safety of the staff, and in compliance with appropriate regulations as defined in the [Hazardous Material Transportation Manual](#) Program Description.

The Packaging and Transportation Group (P&TG) from the Environmental Protection Division (EPD), the Waste Management Group (WMG) from EPD, and the Distribution Group from the Property and Procurement Management Division perform movement by vehicle of hazmat under their approved operational procedures. These three groups are considered the shipping organizations at Brookhaven. All of their SOPs that govern movement of hazardous and radioactive material on site have been reviewed by the Transportation Safety Officer for compliance with the BNL HMTM.

Refer to the [Transfer \(i.e., Movement by Vehicle\) of Hazardous Material On-site Flowchart](#) or the [Transfer \(i.e., Movement by Vehicle\) of Radioactive Material On-site Flowchart](#) for an overview of the procedures described in this subject area. See the [Hazardous Material Transportation Safety Management System Description](#) for an overview of the Transportation Safety Program.

## Contents

**Section**

**Overview of Content**  
(see section for full process)

### 1. Packaging and Movement of Materials of Trade (MOT) On-site

- Transfer and package MOT in compliance with Laboratory and regulatory requirements.

### 2. Packaging and Movement by Vehicle of Hazardous Material On-site (Non-MOT)

- Transfer and package material in compliance with Laboratory and regulatory requirements.
- Determine if material is excluded as MOT.
- Determine if chemical container is bar coded with CMS label.

### 3. Packaging and Movement by Vehicle of Radioactive Material On-site

- Transfer and package material in compliance with Laboratory and regulatory requirements.
- Determine if material meets the DOE definition of radiological material.

#### Definitions

#### **Exhibits**

[Transfer \(i.e., Movement by Vehicle\) of Hazardous Material On-site Flowchart](#)  
[Transfer \(i.e., Movement by Vehicle\) of Radioactive Material On-site Flowchart](#)

#### **Forms**

[BNL On-site Transfer/Safety Assessment Form \(TSAF\)](#)

## **Training Requirements and Reporting Obligations**

This subject area contains the following training requirement (see the [BNL Training and Qualifications](#) website):

- TQ-MOVEHAZ, "How to Move Haz/Rad Materials On-site in a Vehicle."

#### **MANDATORY TRAINING**

**Any person that moves hazardous material, including MOT, on-site must take the above stated Computer-Based Training. Retraining must occur every three years.**

**Consult [Chapter 10 Personnel Qualification and Training of the Hazardous Material Transportation Manual](#) Program Description for licensing requirements for on-site operations of vehicles.**

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This subject area does not contain reporting obligations.

## External/Internal Requirements

Requirement Number	Requirement Title
<a href="#">10 CFR 71</a>	Packaging and Transportation of Radioactive Material
<a href="#">49 CFR 107</a>	Transportation/Hazardous Materials Program Procedures
<a href="#">49 CFR 171</a>	Transportation/General Information, Regulations, and Definitions
<a href="#">49 CFR 172</a>	Transportation/Hazardous Materials Regulations/ Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
<a href="#">49 CFR 173</a>	Transportation/Shippers - General Requirements for Shipments and Packagings
<a href="#">49 CFR 174</a>	Transportation/Carriage by Rail
<a href="#">49 CFR 175</a>	Transportation/Carriage by Aircraft
<a href="#">49 CFR 176</a>	Transportation/Carriage by Vessel
<a href="#">49 CFR 177</a>	Transportation/Carriage by Public Highway
<a href="#">49 CFR 178</a>	Transportation/Specifications for Packagings
<a href="#">49 CFR 179</a>	Transportation/Specifications for Tank Cars
<a href="#">49 CFR 180</a>	Transportation/Continuing Qualification and Maintenance of Packagings
<a href="#">49 CFR 383</a>	Transportation/Commercial Drivers License Standards; Requirements and Penalties
<a href="#">49 CFR 390</a>	Transportation/Federal Motor Carrier Safety Regulations; General
<a href="#">49 CFR 391</a>	Transportation/Qualifications of Drivers
<a href="#">49 CFR 392</a>	Transportation/Driving of Commercial Motor Vehicles
<a href="#">49 CFR 393</a>	Transportation/Parts and Accessories Necessary for Safe Operation
<a href="#">49 CFR 395</a>	Transportation/Hours of Service of Drivers

<a href="#">49 CFR 396</a>	Transportation/Inspection, Repair, and Maintenance
<a href="#">49 CFR 397</a>	Transportation/Transportation of Hazardous Materials; Driving and Parking Rules
<a href="#">O 151.1C</a>	Comprehensive Emergency Management System
<a href="#">O 435.1 Change 1</a>	CRD - Radioactive Waste Management
<a href="#">O 460.1C (May 14, 2010)</a>	Packaging and Transportation Safety
<a href="#">O 460.2A</a>	Departmental Materials Transportation and Packaging Management

## References

49 CFR 173.6, Materials of Trade

[Chemical Management System Chemical Transfer Sheet](#)

DOE-STD-1027-92 Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports

[Government Vehicles](#) Subject Area

[Hazardous Material Transportation Manual](#) Program Description

[Hazardous Material Transportation Safety](#) Management System Description

[Hazardous Waste Management](#) Subject Area

[MOT Fact Sheet](#)

[Spill Response](#) Subject Area

[Transportation of Hazardous and Radiological Materials Off-site](#) Subject Area

## Standards of Performance

Managers shall manage work to control risks and hazards, ensure customer satisfaction, and provide a benefit to BNL.

Managers shall analyze work for hazards, authorize work to proceed, and ensure that work is performed within established controls.

All staff and users shall identify, evaluate, and control hazards in order to ensure that work is conducted safely and in a manner that protects the environment and the public.

Managers shall ensure that work is planned to prevent pollution, minimize waste, and conserve resources, and that work is conducted in a cost-effective manner that eliminates or minimizes environmental impact.

All staff and users shall ensure that they are trained and qualified to carry out their assigned responsibilities, and inform their supervisor if they are assigned to perform work for which they are not properly trained or qualified.

All staff and guests shall promptly report accidents, injuries, ES&H deficiencies, emergencies, and off-normal events in accordance with procedures.

Managers shall establish, implement, and track appropriate actions to correct weaknesses in performance and areas for improvement.

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# PROCEDURE: PACKAGING AND MOVEMENT OF MATERIALS OF TRADE (MOT) ON-SITE

<b>Management System: <a href="#">Hazardous Material Transportation Safety</a></b>		
<b>Subject Area: <a href="#">Movement by Vehicle of Hazardous and Radiological Materials On-site</a></b>		
<b>1. Packaging and Movement of Materials of Trade (MOT) On-site</b>		
Effective Date: <b>Jun 15, 2016</b>	Subject Matter Expert: <a href="#">Michael Clancy Jr</a>	Management System Executive: <a href="#">Jason Remien</a>

## Applicability

This information applies to BNL staff and non-BNL staff who package and move by vehicle Materials of Trade (MOT) between BNL facilities on-site. For the purpose of this Subject Area a vehicle includes any type of machine that is powered by an engine or motor.

## Required Procedure

Certain hazardous materials, when used in direct support of Brookhaven's business, may be transferred from one location to another by a staff member as "Materials of Trade," i.e., hazardous chemicals or other hazardous material which will be consumed by the staff member's work. The regulations for transferring MOT are much less restrictive and are based on a quantity limit for specific Department of Transportation hazard classes. The [BNL Materials of Trade \(MOT\) Table](#) exhibit provides the quantity limits for MOT commonly used at BNL that can be transferred. For those materials that are not in the BNL MOT exhibit, consult a [Transportation Safety Department/Division Point of Contact \(POC\)](#) or the [Transportation Safety Officer \(TSO\)](#) to determine if it can be managed as MOT. The following materials are not MOT: explosives, spontaneous combustible, poisonous by inhalation, radioactive, or a hazardous waste.

Following these procedures ensures that the Laboratory is in compliance with the requirements in 49 CFR 173.6, Materials of Trade.

BNL staff and non-BNL staff transferring MOT follow the steps below.

<b>Step 1</b>	Determine if your material is a Material of Trade <ul style="list-style-type: none"> <li>Review the BNL Materials of Trade (MOT) Table.</li> </ul>
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	<ul style="list-style-type: none"> <li>• If your material is not listed, contact a Transportation Safety Department/Division Point of Contact (POC) for guidance.</li> <li>• If your material is a MOT insure that you only move the quantity allowed. If you cannot move the materials as a MOT go to the section <a href="#">Packaging and Movement by Vehicle of Hazardous Materials On-site (Non-MOT)</a> in this subject area.</li> </ul>
<p><b>Step 2</b></p>	<p>When packaging MOT, ensure that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Incompatible chemicals are not contained in the same outer packaging (See the exhibit on <a href="#">Incompatible Chemicals</a> in the <a href="#">Hazardous Waste Management</a> Subject Area).</li> <li>• Packaging is leak-tight, securely closed, secured against movement in the vehicle, and protected against damage.</li> <li>• Packaging is as good as manufacturer's original packaging, or designed for the specific material. <b>Note:</b> For example, gasoline must be in a metal or plastic container that conforms to OSHA requirements. Containers should have approval marked.</li> <li>• Outer packaging or receptacles are marked with the common name of the hazardous material.</li> <li>• A BNL vehicle is used whenever possible to transfer MOT associated with work at BNL. The driver of a BNL vehicle must follow the <a href="#">Government Vehicles</a> Subject Area.</li> <li>• To use a private vehicle to move MOT, the Department Chair/Division Manager must be notified prior to use.</li> <li>• The Department/Division ES&amp;H Coordinator or designee must communicate to the driver the following requirements:             <ul style="list-style-type: none"> <li>◦ The driver has a valid state driver's license;</li> <li>◦ The vehicle must be in good mechanical condition and have a valid state safety inspection;</li> <li>◦ The vehicle must be insured with at least the required minimum liability insurance required by the state where the vehicle is registered;</li> <li>◦ The driver must obey all state and local traffic rules and regulations;</li> <li>◦ The driver must possess basic hazard information on the commodity being transported (e.g., Material Safety Data Sheet).</li> <li>◦ The driver must be have general knowledge of the MOTs regulations including:                 <ul style="list-style-type: none"> <li>▪ Quantity limitations, packaging requirements, and marking and labeling requirements.</li> <li>▪ See <a href="#">MOT Fact Sheet</a></li> </ul> </li> </ul> </li> </ul> <p><b>Note:</b> Contact a <a href="#">Transportation Safety Subject Matter Expert</a> for assistance in packaging your material.</p> <p><b>Note:</b> If a spill occurs during the transport of MOT, call 911 or 2222 and follow the <a href="#">Spill Response</a> Subject Area.</p>
<p><b>Step 3</b></p>	

Determine if the chemical container is bar coded with a Chemical Management System (CMS) label. If the chemical container has a CMS bar code label and you are transferring it to another building or storage area onsite, complete and forward a [Chemical Management System Chemical Transfer Sheet](#) to the [CMS Team](#), Building 120, to notify them of the new location. Do not remove the CMS bar code label when transferring the chemical container to a new on-site location.

**Note:** When involving contracted services (i.e., riggers), to move material, the requester has the responsibility to comply with CMS requirements.

## Guidelines

The driver should read and possess a copy of the DOT brochure [What Are Materials of Trade, and What Regulations Apply?](#)

## References

[Chemical Management System Chemical Transfer Sheet](#)

[Government Vehicles](#) Subject Area

[Hazardous Waste Management](#) Subject Area

[MOT Fact Sheet](#)

[Spill Response](#) Subject Area

[Transportation of Hazardous and Radiological Materials Off-site](#) Subject Area

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# PROCEDURE: PACKAGING AND MOVEMENT BY VEHICLE OF HAZARDOUS MATERIAL ON-SITE (NON-MOT)

<b>Management System:</b> <a href="#">Hazardous Material Transportation Safety</a>		
<b>Subject Area:</b> <a href="#">Movement by Vehicle of Hazardous and Radiological Materials On-site</a>		
<b>2. Packaging and Movement by Vehicle of Hazardous Material On-site (Non-MOT)</b>		
Effective Date: <b>Jun 15, 2016</b>	Subject Matter Expert: <a href="#">Michael Clancy Jr</a>	Management System Executive: <a href="#">Jason Remien</a>

## Applicability

This information applies to BNL staff and non-BNL staff who package and move by vehicle hazardous material (non-Materials of Trade [MOT]) between BNL facilities on-site. For the purpose of this subject area, a vehicle includes any type of machine that is powered by an engine or motor. This section applies to material that is not radioactive, but has a hazardous trait that may cause harm to a staff member or impact the environment.

The Packaging and Transportation Group (P&TG) from the Environmental Protection Division (EPD), the Waste Management Group (WMG) from EPD, and the Distribution Group from the Property and Procurement Management Division perform movement by vehicle of hazmat under their approved operational procedures.

## Required Procedure

<b>Step 1</b>	Consult the <a href="#">Transportation Safety Subject Matter Expert (SME)</a> (if needed) to package and move by vehicle hazardous material using one of the following methods when the material is being transferred by a motorized vehicle. <ul style="list-style-type: none"> <li>Compliance with DOT regulations (go to <a href="#">Transportation of Hazardous and Radiological Material Off-site</a> Subject Area), or</li> <li>Compliance with the BNL <a href="#">Hazardous Material Transportation Manual (HMTM)</a> Program Description.</li> </ul> <p><b>Note:</b> Following this subject area ensures compliance with the HMTM Program Description).</p>
<b>Step 2</b>	What hazards are associated with this material?

	Explosive (reactive), Compressed gas, Flammable, Spontaneously combustible, Water reactive, Oxidizer, Organic peroxide, Poison, Toxic, Infectious, Corrosive, Environmental Concern (i.e., PCBs).
<b>Step 3</b>	Determine if the material is excluded as MOT (see the section <a href="#">Packaging and Transferring Materials of Trade [MOT] On-site</a> ). If the material is MOT, follow the requirements of that section.
<b>Step 4</b>	Determine if the material to be transferred has already been evaluated using the <a href="#">BNL On-site Transfer/Safety Assessment Form (TSAF)</a> .
<b>Step 5</b>	If the material has been previously evaluated and there are no significant changes (within the bounds evaluated), package and move the material as described on the TSAF. A copy of the TSAF must accompany the material. Go to step 11.
<b>Step 6</b>	If material has not been previously evaluated, complete the TSAF. For guidance regarding the completion of this form, read <a href="#">Chapter 5 of the HMTM Program Description</a> and notify a Transportation Safety SME.
<b>Step 7</b>	Submit the completed TSAF to the BNL Transportation Safety Officer (TSO) for approval.
<b>Step 8</b>	The TSO will return the approved TSAF to the requester. The TSAF will prescribe controls (i.e., packaging, labeling, drivers license) to be followed during the movement. If the TSAF was issued for multiple movements it will be valid and usable for two years, provided nothing has changed with the material being moved.
<b>Step 9</b>	Determine if the chemical container is bar coded with a CMS label. If the chemical container has a CMS bar code label and you are transporting it to another building or storage area onsite, complete and forward a <a href="#">Chemical Management System Chemical Transfer Sheet</a> to the <a href="#">CMS Team</a> , Building 120, to notify them of the new location. Do not remove the CMS bar code label when transferring the chemical container to a new on-site location.
<b>Step 10</b>	<p>When packaging hazardous materials, make sure that the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Incompatible chemicals are not contained in the same outer packaging (see the exhibit on <a href="#">Incompatible Chemicals</a> in the <a href="#">Hazardous Waste Management</a> Subject Area).</li> <li>• Packaging, original manufacturer's preferred, is leak-tight, securely closed, secured against movement (blocked and braced), and protected against damage. The approved TSAF will provide details on packaging and securement.</li> <li>• Warning-Glass containers and other breakable containers must be placed in an outer packaging with cushioning to prevent it from breakage during movement.</li> <li>• The package must be placed in the vehicle and secured (i.e., blocked and braced) so it will not shift during the movement.</li> <li>• Outer packaging or receptacles are marked with the common name of the hazardous material.</li> </ul> <p><b>Note:</b> Contact a Transportation Safety SME for assistance with packaging if necessary.</p>

**Step 11** Move the material according to the requirements of the approved TSAF.  
A copy of the TSAF must be carried by the driver of the vehicle during the loading and movement of the hazmat.

**Note:** If there are any injuries/spills of this material during transfer, call 911 or 2222 and follow the [Spill Response](#) Subject Area.

**Note:** The most expedient route should be utilized for hazardous material transfers, with no unnecessary stopovers.

**Note:** Only Laboratory/government vehicles may be used for non-MOT.

## References

[Chemical Management System Chemical Transfer Sheet](#)

[Hazardous Material Transportation Manual](#) Program Description

[Spill Response](#) Subject Area

[Transportation of Hazardous and Radiological Material Off-site](#) Subject Area

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## PROCEDURE: PACKAGING AND MOVEMENT BY VEHICLE OF RADIOACTIVE MATERIAL ON-SITE

<b>Management System:</b> <a href="#">Hazardous Material Transportation Safety</a>		
<b>Subject Area:</b> <a href="#">Movement by Vehicle of Hazardous and Radiological Materials On-site</a>		
<b>3. Packaging and Movement by Vehicle of Radioactive Material On-site</b>		
Effective Date: <b>Jun 15, 2016</b>	Subject Matter Expert: <a href="#">Michael Clancy Jr</a>	Management System Executive: <a href="#">Jason Remien</a>

### Applicability

This information applies to BNL staff and non-BNL staff who package and transfer radioactive material between BNL facilities on-site in a Laboratory vehicle. For the purpose of this Subject Area a vehicle includes any type of machine that is powered by an engine or motor.

The Packaging and Transportation Group (P&TG) from the Environmental Protection Division (EPD), the Waste Management Group (WGM) from EPD, and the Distribution Group from the Property and Procurement Management Division perform movement by vehicle of hazmat under their approved operational procedures.

**SPECIAL NOTE:** 10 CFR 830.200 - Subpart B, Safety Basis Requirements, requires all on-site transportation activities meeting the definition of a Hazard Category 3 (HC-3) non-reactor nuclear facility or above to have a DOE-approved Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR) in place before transfers. If your material is greater than an HC-3 quantity, you may not move your material using this subject area and you must contact the [Transportation Safety Officer \(TSO\)](#). Materials moved as part of Accelerator Operations as defined by DOE Order 420.2C "Safety of Accelerator Facilities" are not subject to the Nuclear Facility rules.

### Required Procedure

This subject area is designed to ensure that all radioactive material that is required to be moved by vehicle on-site will be properly packaged, labeled, and handled to ensure the safety of the staff and in compliance with appropriate regulations.

BNL staff and non-BNL staff transferring radioactive material follow the steps below.

<b>Step 1</b>	Consult the <a href="#">Transportation Safety Department/Division Point of Contact (POC)</a> and <a href="#">Facility Support Representative</a> to package and move by vehicle radioactive material using one of the following methods when the material is being transferred by a motorized vehicle.
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	<ul style="list-style-type: none"> <li>• Compliance with DOT regulations (go to the <a href="#">Transportation of Hazardous and Radioactive Materials Off-site</a> Subject Area) or</li> <li>• Compliance with the BNL <a href="#">Hazardous Material Transportation Manual (HMTM)</a> Program Description</li> </ul> <p><b>Note:</b> Following this subject area ensures compliance with the HMTM Program Description).</p> <p><b>Note:</b> You have the option to call the Packaging and Transportation Group from EPD to package and transfer the radioactive material for you.</p> <p><b>Note:</b> If the material is accountable nuclear and/or fissile, contact the Radiological Control Division's (RCD) Nuclear Materials Management (NMM) Section. <b>Do not proceed further.</b></p>
<b>Step 2</b>	<p>With the assistance of a Facility Support Representative or Technician, determine if the material meets the DOE definition of radiological material that must be controlled, and/or marked/labeled in accordance with the BNL Radiological Control Manual. Radioactive material includes activated material, contaminated material, sources, sealed sources, and radioactive waste. The material can be solid, liquid, or gas.</p>
<b>Step 3</b>	<p>If the material does not meet the DOE definition (see step 2), the material is not radioactive for the purpose of this subject area; work with the FS Rep to move the material.</p>
<b>Step 4</b>	<p>If the material meets the definition of radioactive material, follow the remaining steps of this subject area.</p>
<b>Step 5</b>	<p>Radioactive material may be transferred under the supervision of a Facility Support Representative or Technician, using the established Facility Support Services' procedures ( e.g., Radiological Work Permit, <a href="#">Release of Materials from Controlled Radiological Areas, Work Planning and Control for Experiments and Operations</a> Subject Area) provided all the following criteria are met:</p> <ul style="list-style-type: none"> <li>• Dose rate is &lt;100 mrem/hr at 30 cm;</li> <li>• Activity does not exceed 10 times the limits established in Appendix E of 10 CFR 835 in any form;</li> <li>• No smearable contamination on the outside of the package greater than the release criteria;</li> <li>• The material is not accountable nuclear and/or fissile contaminated material.</li> </ul> <p>If the material exceeds any of the above criteria, it must go through a Safety Assessment and be documented on the <a href="#">BNL On-site Transfer/Safety Assessment Form (TSAF)</a>.</p>
<b>Step 6</b>	<p>All radioactive material must be packaged for movement. The TSO can approve material for unpackaged movement based on the risk of the spread of contamination. Handheld industrial hygiene and radiation detection instruments used to perform field surveys with check sources permanently attached to the exterior or installed within the unit may be moved unpackaged.</p> <p>When packaging radioactive materials, make sure that the following conditions are met:</p>

	<ul style="list-style-type: none"> <li>• Incompatible materials are not contained in the same outer packaging (see the exhibit <a href="#">Examples of Incompatible Chemicals</a> in the <a href="#">Hazardous Waste Management</a> Subject Area);</li> <li>• Packaging must be designed to contain the material to prevent the spread of contamination or leakage, and must be securely closed.</li> <li>• <b>Warning:</b> Glass containers and other breakable containers must be placed in an outer packaging with cushioning to prevent it from breakage during movement;</li> <li>• The package or material must be placed in the vehicle and secured (i.e., blocked and braced) so it will not shift during the movement. This includes unpackaged material and handheld radiation detection instruments with check sources permanently attached to the exterior of the unit. The source must be inspected for damage before and after movement.</li> <li>• Packaging material in the manufacturer's original packaging or in as good as manufacturer's original packaging;             <ul style="list-style-type: none"> <li>◦ Sources and sealed sources require packaging for movement by vehicle.</li> </ul> </li> <li>• No smearable contamination on the outside of the package;</li> <li>• Affix a properly filled out Radioactive Label/Tag;</li> <li>• All packaging and transfers should be done while trying to keep the dose to the workers and/or public As Low as Reasonably Achievable (ALARA);</li> <li>• The approved TSAF will have specific requirements for packaging and blocking and bracing based on the risk of the material.</li> </ul> <p><b>Note:</b> In some cases, due to the configuration and type of material, no additional packaging may be necessary. The material itself may serve as the package (e.g., certain magnets, piping materials). The TSO will approve material eligible for unpackaged movement.</p> <p><b>Note:</b> Contact a Transportation Safety SME for assistance with packaging if necessary.</p>
<p><b>Step 7</b></p>	<p>If material has been previously evaluated and there are no significant changes (within the bounds evaluated) in the approved BNL On-site Transfer/Safety Assessment Form (TSAF), the material would then qualify as a repetitive transfer.</p>
<p><b>Step 8</b></p>	<p>If material has not been previously evaluated, complete the <a href="#">TSAF</a>. For guidance regarding the completion of this form, read Chapter 5 of the HMTM Program Description and notify a Transportation Safety SME.</p>
<p><b>Step 9</b></p>	<p>Submit the completed TSAF to the BNL Transportation Safety Officer (TSO) for approval.</p>
<p><b>Step 10</b></p>	<p>The TSO will return the approved TSAF to the requester. The TSAF will prescribe controls (i.e., packaging, labeling, drivers license) to be followed during the movement. If the TSAF was issued for multiple movements it will be valid and usable for two years, provided nothing has changed with the material being moved</p>
<p><b>Step 11</b></p>	<p>A copy of the TSAF must accompany each movement.</p> <p><b>Note:</b> If there are any injuries/spills of this material during transfer, then call 911 or 2222 and follow the <a href="#">Spill Response</a> Subject Area.</p> <p><b>Note:</b> The most expedient route should be used for radioactive material transfers, with no unnecessary stopovers.</p>

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## References

DOE-STD-1027-92 Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports

[Hazardous Material Transportation Manual](#) Program Description

[Hazardous Waste Management](#) Subject Area

[Radiological Control Manual](#) Program Description

[Release of Materials from Controlled Radiological Areas](#)

[Spill Response](#) Subject Area

[Transportation of Hazardous and Radioactive Materials Off-site](#) Subject Area

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# EXHIBIT: TRANSFER (I.E., MOVEMENT BY VEHICLE) OF HAZARDOUS MATERIAL ON-SITE FLOWCHART

Management System: [Hazardous Material Transportation Safety](#)

Subject Area: [Movement by Vehicle of Hazardous and Radiological Materials On-site](#)

## Transfer (i.e., Movement by Vehicle) of Hazardous Material On-site Flowchart

Effective Date: Jun 15, 2016

[Transfer \(i.e., Movement by Vehicle\) of Hazardous Material On-site Flowchart](#) is provided as a PDF.

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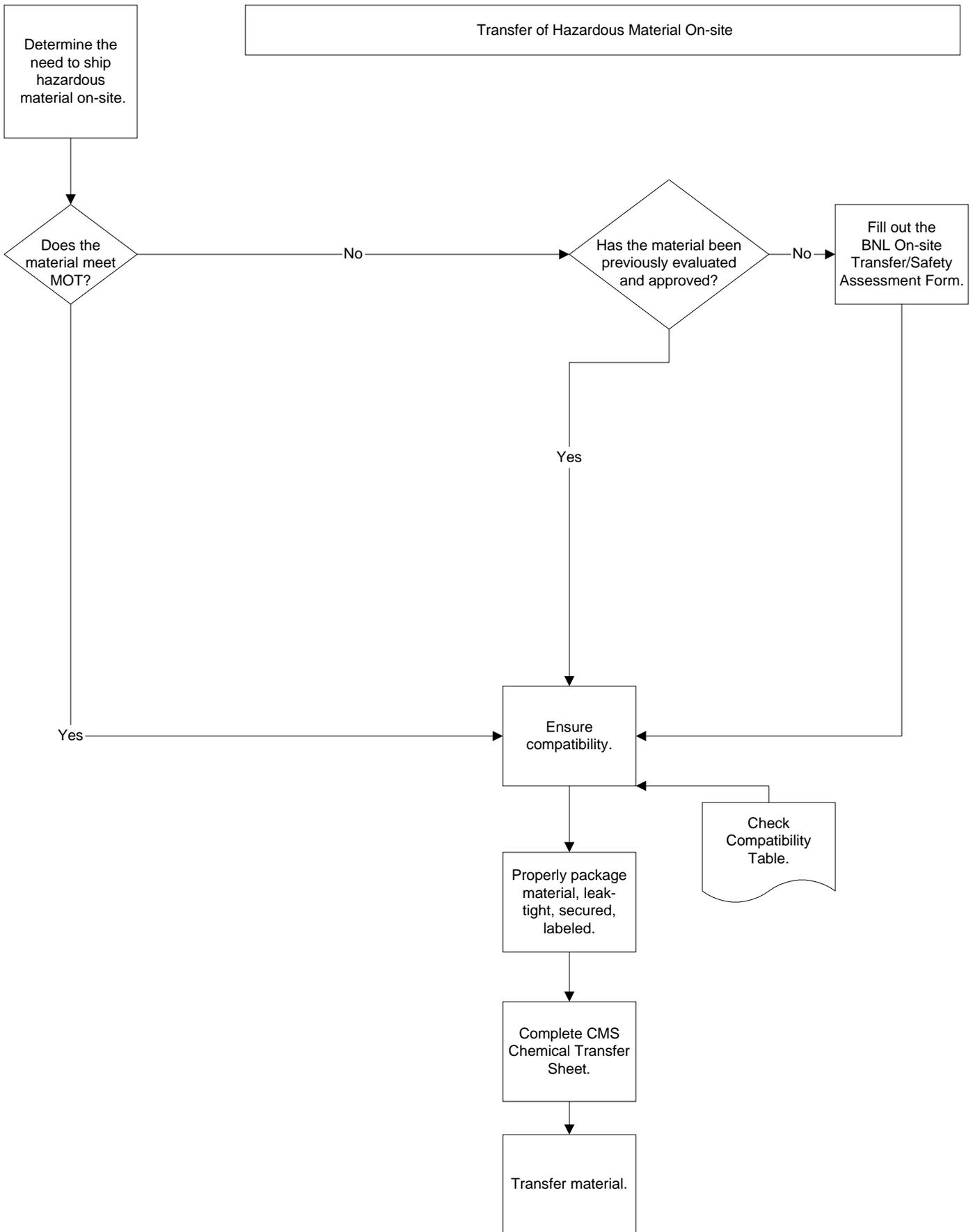
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Transfer of Hazardous Material On-site



# EXHIBIT: TRANSFER (I.E., MOVEMENT BY VEHICLE) OF RADIOACTIVE MATERIAL ON-SITE FLOWCHART

Management System: [Hazardous Material Transportation Safety](#)

Subject Area: [Movement by Vehicle of Hazardous and Radiological Materials On-site](#)

## Transfer (i.e., Movement by Vehicle) of Radioactive Material On-site Flowchart

Effective Date: Jun 15, 2016

[Transfer \(i.e., Movement by Vehicle\) of Radioactive Material On-site Flowchart](#) is provided as a PDF.

The only official copy of this file is the one on-line in SBMS.

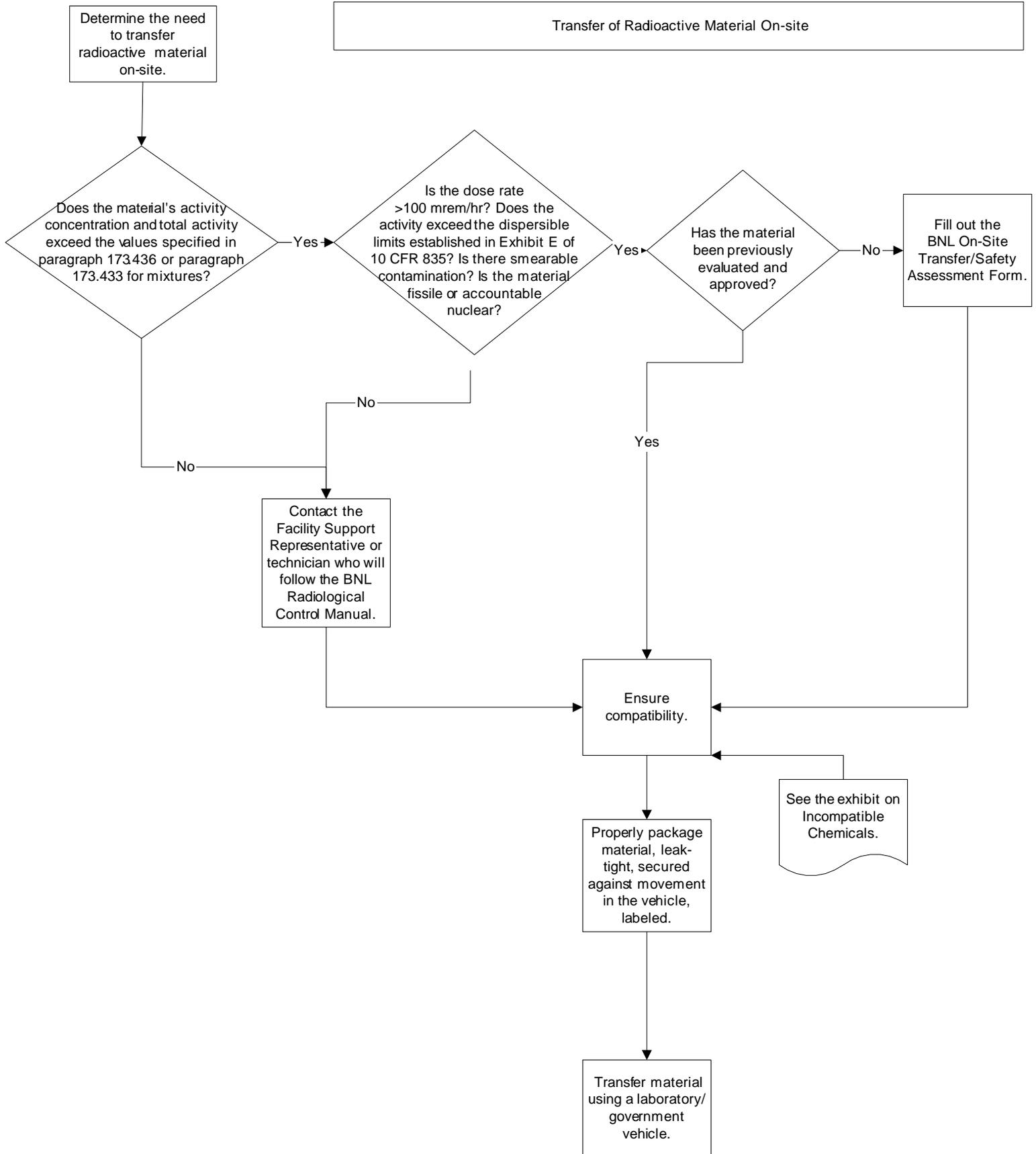
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Transfer of Radioactive Material On-site



# FORM: BNL ON-SITE TRANSFER/SAFETY ASSESSMENT FORM (TSAF)

Management System: [Hazardous Material Transportation Safety](#)

Subject Area: [Movement by Vehicle of Hazardous and Radiological Materials On-site](#)

## BNL On-site Transfer/Safety Assessment Form (TSAF)

Effective Date: Jun 15, 2016

The [BNL On-site Transfer/Safety Assessment Form \(TSAF\)](#) is provided as a Word file.

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## BNL On-site Transfer/Safety Assessment Form (TSAF)

Requested By:

Department/Division:

Principal Investigator:

Date of Transfer:

From Building/Area:

Time of Transfer:

Building or Area:

**Safety Assessment** (Chapter 5 of the HMTM provides detailed guidance).

### 1. Material Characteristics/Classification

a) Name (e.g., Commercial, CAS):

b) Quantity:

c) Type of Container:

d) Radioactive:

Yes  No

e) Isotopes of Concern and Estimated Level of Activity:

*If the material is classified as radioactive, Facility Support must provide a radiological survey before transferring it, and attach completed survey.*

f) Does the material contain fissionable isotopes ? Yes  No

*If No, you may proceed to question (g ) without the involvement of BNL Criticality Safety Officer.*

*If Yes, the BNL Criticality Safety Officer (CSO) must be contacted to ensure the receiving facility fissionable material inventory limits have not been exceeded and to evaluate the need for criticality safety measures and controls in accordance with the [Criticality Safety](#) section of the [Nuclear/Criticality Safety](#) Subject Area.*

*A memo from the CSO to the BNL Transportation Safety Officer shall be prepared to document the evaluation.*

g) Is the material hazardous, as defined in 49 CFR 172.101, Chapter 6 or Chapter 7 of the HMTM? Yes  No

*If yes, then you are required to continue this safety assessment analysis unless the material meets one of the following criteria:*

- The transfer is covered by Subject Areas and has previously been evaluated for transfer by the Isotopes and Special Materials Group, Shipping and Receiving, Waste Management Group, or the Transportation Safety Officer (TSO).
- The transfer is routine and has been previously evaluated for transfer.
- Material is defined as a Material of Trade or is a Small Quantity Exempted.

h) Is the material a Material of Trade (MOT)? Yes  No

i) Is the material an excepted quantity as defined by 49 CFR (e.g., limited quantity, small quantity)? Yes  No

j) Is this material being moved entirely within an Accelerator Operations Area as defined by DOE Order 420.2C Safety of Accelerator Facilities? Yes  No   
If Yes, proceed to question (l)

k) Does the material meet the definition of radioactive material in quantities greater than the DOE-STD-1027-92 thresholds, LA-12981-MS, US-940, Revision 1, Table of DOE-STD-1027-92 Hazard Category 3 Threshold Quantities for the ICRP-30 List of 757 Radionuclides for Hazard Category 3 Non-Reactor Nuclear Facility quantity? (See Table A.1. Thresholds for Radionuclides). Yes  No

Document the Sum of Fractions calculation as follows:

Table 1

Nuclide	Activity	TQ	TQ Source	Activity/TQ
			<b>Summation:</b>	

The Threshold Quantity values must be based on DOE STD-1027-92, LA-12981-MS, US-940, or otherwise be approved by DOE.

If No, proceed to question (l)

If Yes, Is the radioactive material either in special form or packaged in a Type B container and for either case accompanied by certification and approval documentation per DOE-STD-1027-92 Chg 1?

Yes  No

If No, STOP SAM PROCESS! ON-SITE TRANSFER SHALL BE MADE IN ACCORD WITH BNL FACILITY HAZARD CATEGORIZATION and NUCLEAR/CRITICALITY SAFETY SUBJECT AREAS AND MAY NEED A DOE APPROVED BNL ON-SITE TRANSPORTATION DOCUMENTED SAFETY ANALYSIS.

If Yes, Provide the TSO with all backup certification, test, and approval documentation for the source, radioactive material, and or package to determine if material is not subject to 10 CFR 830.200 - Subpart B, Safety Basis Requirements. If Yes, the BNL Nuclear Safety Officer (NSO) must review all documentation and approve the SAM.

DO NOT CONTINUE WITH SAM PROCESS UNTIL SOURCE OR PACKAGE DOCUMENTATION IS ACCEPTABLE BY TSO and NSO.

l) What is the materials classification: Hazard Class: UN #:

## 2. Material Hazard Assessment

What hazard does your material pose? (See Chapter 6 of the HMTM for guidance).

- |        |                      |                          |
|--------|----------------------|--------------------------|
| Low    | (PG III)             | <input type="checkbox"/> |
| Medium | (PG II)              | <input type="checkbox"/> |
| High   | (PG I)               | <input type="checkbox"/> |
| Low    | No Packing Group     | <input type="checkbox"/> |
| Low    | Excepted Radioactive | <input type="checkbox"/> |
| Medium | LSA/SCO              | <input type="checkbox"/> |
| High   | Type A               | <input type="checkbox"/> |

## 3. Material Hazard Level

What hazard would your material pose to personnel, equipment, and environment should containment be lost during transfer?

- |        |                          |
|--------|--------------------------|
| Low    | <input type="checkbox"/> |
| Medium | <input type="checkbox"/> |
| High   | <input type="checkbox"/> |

## 4. Package Types

What type of package is your material in?

- |         |        |                          |
|---------|--------|--------------------------|
| DOT     | Low    | <input type="checkbox"/> |
| DOT-E   | Medium | <input type="checkbox"/> |
| Non-DOT | High   | <input type="checkbox"/> |

*If your package is Non-DOT, it must be evaluated in accordance with Chapter 5 of the HMTM, and you must acquire approval from the TSO before transferring your material in this package.*

## 5. Transfer Assessment

What type of transfer is this?

- |               |        |                          |
|---------------|--------|--------------------------|
| Routine       | Low    | <input type="checkbox"/> |
| Exclusive Use | Medium | <input type="checkbox"/> |
| Non-routine   | High   | <input type="checkbox"/> |

*If more than one hazardous material is being transferred on the transport vehicle, check compatibility of lading with packaging materials and compatibility during transport of multiple hazardous materials.*

What hazard does transferring your material pose? (See Chapters 5, 6, and 7 of the HMTM).

- |        |                          |
|--------|--------------------------|
| Low    | <input type="checkbox"/> |
| Medium | <input type="checkbox"/> |
| High   | <input type="checkbox"/> |

## 6. Transportation System Assessment and Evaluation

Using the information gathered in steps 1 through 5, determine the minimum requirements that your transportation system must have to transfer your material. Examples of using the information gathered in step 1 through 5 can be found in Section 5 of the HMTM.

## Determining the Risk Level of Hazard and Selecting the Transportation System

Each step in the SAM process, beginning with material classification, is assigned a point value based on the factors the SME has determined. These risk point values are as follows:

SAM Form Section	Question	Answer	Risk Point Value
1.0(d) Material Classification	Is the material radioactive?	Yes: No:	2 points 0 points
1.0(f) Material Classification	Does the material contain fissile materials?	Yes: No:	2 points 0 points
1.0(g) Material Classification	Is the material hazardous as defined by 49 CFR?	Yes: No:	2 points 0 points
1.0(h) Material Classification	Is the material defined as an MOT?	Yes: No:	0 points 2 points
1.0(i) Material Classification	Is the material defined as an excepted quantity?	Yes: No:	0 points 2 points
1.0(j) Material Classification	Does the material meet the definition of radioactive materials greater than the DOE STD-1027-92 thresholds for Category 3 Nuclear quantities?	Yes:  No:	STOP. Your material is not allowed to be transferred under this process  0 points
1.0 Material Classification Risk Points			
2.0 Material Hazard Assessment (Non-radioactive)	What hazard does your material pose?	None Low (PG III) Medium (PG II) High (PG I)	0 points 1 point 2 points 3 points
2.0 Material Hazard Assessment (Radioactive)	What hazard does your material pose?	Low (Excepted Material) Medium (LSA/SCO) High (Type A )	1 point 2 points 3 points
2.0 Material Hazard Assessment Risk Points			
3.0 Material Hazard Level	What hazard would your material pose should containment be lost?	Low Medium High	1 point 2 points 3 points
3.0 Material Hazard Level Risk Points			
4.0 Package Type	What type of package is your material in?	DOT certified or approved DOT-E (equivalent) Non-DOT	1 point 2 points 3 points
4.0 Package Type Risk Points			
5.0a Transfer Assessment	What type of transfer is this?	Routine Exclusive Use Non-Routine	1 point 2 points 3 points
5.0b Transfer Assessment	What overall hazard does transferring your material pose?	Low Medium High	1 point 2 points 3 points
5.0 Transfer Assessment Risk Points			
1.0 through 5.0 Risk Point Total			

Table 1 Point Value System

Add up the Risk Points determined in Table 1 and compare the Risk Point Total to Table 2 values below. The Risk Point Total and Transportation System Assessment Hazard Level determine the performance requirements for material transfer unless otherwise directed by the TSO or the TSO designee.

Transportation System Assessment Hazard Level	Risk Point Total Range
Low	< 11
Medium	12-21
High	22-28

Table 2 Transportation System Assessment

Based on the Transportation System Assessment Hazard Level selected from Table 2, go to Section 5.4 of the HMTM for the performance requirements appropriate for the material transfer.

Your material transfer has been rated as low  medium  high

Therefore, your transportation system must meet the requirements for that level stated in MTM Chapter 5 Section 5.4 unless otherwise determined by the TSO or the TSO designee.

**7. Transportation System Documentation**

This document must accompany the transfer and be located in the glove box or the driver's side door pocket.

**8. Packaging and Transfer Details**

Identify performance requirements for this transfer (e.g., the specific type of package, labeling requirements, hazard communication requirements, transport routes).

***If the material is in "special form" or in a Type B container, and/or the "Summation Value" in Table 1 in Section J is equal to or greater than 0.1 the form must be reviewed and approved by the BNL Nuclear Safety Officer. The Transportation Safety Officer will forward the document to the NSO when applicable:***

Forward to NSO Yes  No

\_\_\_\_\_  
Nuclear Safety Officer Approval Date

\_\_\_\_\_  
Transportation Safety Officer or SME Approval Date

**NOTE: The approval is only valid for 2 years from the signed date provided that there are no changes to the material or packaging. If any condition is changed or deviations have to be made from Section 8, resubmit the SAM for approval.**

## DEFINITIONS

### **Definition: Movement by Vehicle of Hazardous and Radiological Materials On-site**

Term	Definition
hazardous material	A substance that has been determined to pose an unreasonable risk to health, safety, and property when transported in commerce. A hazardous material includes hazardous waste and hazardous substances.
high hazard	Material that, if containment is lost, has been determined to pose an extreme danger or health hazard to the emergency response personnel (e.g., regulatory limits could be exceeded), and significant damage to the environment or equipment will result.
low hazard	Material that, if containment is lost (e.g., the package breaks), has been determined to pose little danger or health hazard to emergency response personnel, and little or no damage to the environment or equipment will result.
Materials of Trade (MOT) (adapted for BNL use; see 49 CFR 171.8 for DOT's definition)	Certain hazardous materials, when used in direct support of Brookhaven's business, may be transported from one location to another by a staff member for his or her own use as Materials of Trade, i.e., hazardous chemicals or other hazardous material that will be consumed by a staff member's work. The regulations for transporting MOT are much less restrictive and are based on a quantity limit for specific Department of Transportation hazard classes. The BNL Materials of Trade (MOT) exhibit provides the quantity limits for MOT commonly used at BNL that can be transported.
medium hazard	Material that, if containment is lost, has been determined to pose a moderate danger or health hazard to the emergency response personnel (e.g., no regulatory exposure limit would be exceeded for radiological or chemical controls), and moderate damage to the environment or equipment will result.
on-site movement	The transfer of hazardous material between facilities using motorized transport within the confines of the BNL-site boundary.
Transportation Safety Department/Division Point of Contact (POC)	Each Department/Division that has a need to ship or receive any radiological and/or hazardous material will have an established point of contact for transportation safety matters. The TSO or designee, TSWG members, and SMEs normally interact with organizational contacts. These contacts are designated by the Department/Division management. Usually one of the following is identified as the contact: an

	ESH&Q Representative or ES&H Coordinator. (The contact may also be an SME if training is obtained and maintained). The contact assists in determining transport requirements. If further clarification is needed, the TSO or a Transportation Safety SME is consulted.
Transportation Safety Subject Matter Experts (SME)	Staff designated as SMEs for transportation safety are trained and qualified in a specific area of expertise (e.g., radiological, hazmat, air transport). The TSO or designee, TSWG members, and POCs normally interact with Transportation Safety Subject Matter Experts. The SMEs are designated by the Department/Division management and approved by the TSO. The SMEs are expected to work in compliance with work planning and BNL transportation safety requirements.

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