

Table 2.2 Diversion Path Analysis: Generic Route Pu-239, Undeclared Facilities

POTENTIAL FACILITY / SOURCES OF MATERIALS	RISK RELEVANT PARAMETERS	URANIUM MINE	URANIUM MILL	URANIUM CONVERSION	POWER/DUAL PURPOSE/ PRODUCTION REACTOR	RESEARCH/ TEST REACTOR	PU ENRICHMENT	PU REPROCESSING FACILITY	SMUGGLED PLUTONIUM MATERIAL		EXISTING STOCKPILES	
							(LASER ISOTOPE SEPARATION)		IRRADIATED FUEL	PU EXTRACTED FROM FUEL		
LIKELIHOOD OF FACILITY ANOMALY (L)	NWS	low	low	low	very low	very low	Proposed special isotope separation plant cancelled (US)	low	very low	very low	high	
	NNWSD	low	low	low	very low	very low	very low	medium	very low	very low	low	
	NNWSU	high (if state has research reactor)	high	high	power reactor only	high	very low	high	low	high	very low	
IMPORTANCE OF FACILITY ANOMALY TO FINAL MATERIAL ACQUISITION (I)		low	low	low	high	high	very low	high	low	high	high	
DIVERSION SIGNATURES		Same as for see Table 2.1			<ul style="list-style-type: none"> physical size & structural features security fencing thermal emissions electrical transmission network gaseous/liquid active emissions 	<ul style="list-style-type: none"> physical size & structural features security fencing air defence systems thermal emissions gaseous/ liquid active emissions 	<ul style="list-style-type: none"> EM laser emissions? building type and size not distinguishable? 	<ul style="list-style-type: none"> radioactive discharges (I-129, Kr-85) active liquid waste tank storage 	<ul style="list-style-type: none"> heavy/large containers need for storage and transport fuel is self-protected by theft by high activity export controls information 	<ul style="list-style-type: none"> Pu activity from reprocessed fuel not a large problem export controls information 	<ul style="list-style-type: none"> intelligence information 	
VERIFICATION METHODS	Technical Means	Same as for see Table 2.1			<ul style="list-style-type: none"> infra-red & optical satellite reconnaissance 	<ul style="list-style-type: none"> infra-red & optical satellite reconnaissance 	<ul style="list-style-type: none"> remote EM detection (not demonstrated to date?) 	<ul style="list-style-type: none"> remote monitoring/ sampling of airborne activity and liquid discharges 	<ul style="list-style-type: none"> intelligence information 	<ul style="list-style-type: none"> intelligence information 	<ul style="list-style-type: none"> satellite reconnaissance observation of storage location shipment transfers 	
	Routine Inspections	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Special Inspections	Same as for see Table 2.1			<ul style="list-style-type: none"> physical inspection provides confirmation of size, design type specifics radiation monitoring confirms current production status spent fuel storage inspection indicates past production 	<ul style="list-style-type: none"> physical inspection provides confirmation of size, design type specifics radiation monitoring confirms production status spent fuel storage inspection indicates past production 	<ul style="list-style-type: none"> physical inspection and assay measurements needed to confirm purpose divulgence of design & operational knowledge needed to assess capability 	<ul style="list-style-type: none"> physical inspection and divulgence of design & operational knowledge needed to assess capability 	<ul style="list-style-type: none"> Interception required to confirm 	<ul style="list-style-type: none"> Interception required to confirm 	<ul style="list-style-type: none"> physical inspection and portable radiation monitoring to confirm Pu 	
EFFECTIVENESS OF VERIFICATION METHODS		Same as for see Table 2.1			<ul style="list-style-type: none"> TM conclusively identify facility SI verifies actual diversion conclusively 	<ul style="list-style-type: none"> TM conclusively identify facility SI verifies actual diversion conclusively 	<ul style="list-style-type: none"> SI needed to confirm purpose and capability 	<ul style="list-style-type: none"> TM conclusively identify purpose SI identifies capability 	<ul style="list-style-type: none"> Interception required to confirm 	<ul style="list-style-type: none"> Interception required to confirm 	<ul style="list-style-type: none"> TM not conclusive 	
See Figure 3 for risk ranking hierarchy and Figures 3.2.2a, b and c for the relative risk rankings for NWS, NNWSD and NNWSU respectively												
RISK OF DIVERSION (L x I)		NWS	8	9	10	2(DP) 5(POW) 7(PROD)	4	12	3	11	6	1
		NNWSD	8	9	10	2(DP) 5(POW) 8(PROD)	4	12	3	11	7	1
		NNWSU	7	8	9	4(POW)	3	10	2	6	1	5