

Risk Based Model for Compliance Assurance Inspections for the Non-Nuclear Sector

Panel 325

PATRAM

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Non-Nuclear Sector?



A Risk Model is required because:

- We have ~2500 duty holders and only 3 inspectors;
- We want to target the higher risk organisations; and
- We should be able to objectively justify our inspection regime.

Risk Model Development

- Hypothesis was that risk was a function of:
 - Total RAM items held;
 - Package types relative to Radionuclide inventory;
 - Number of movements per year;
 - Registered QA system or not;
 - RAM transport part of QA system or not; and
 - Awareness of Security Regulations.

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Control Number	EA Number	Address	Town	County	Post Code	Total RAM items held	Details of RAM items held	Details of packages used	Total number of movements per year	Is the QA System registered? (Y/N)	RAM transport included in QA	Aware of ADR 110? (Y/N)	Comments	Records of interest	Parameter A for Risk model	Parameter B for risk model	Parameter C for risk model	Risk model - QA system	Risk model - RAM in QA system	Risk model - ADR 110 aware	Risk' value	comments
1792	CC1945					250000		Cardboard boxes of various sizes.	Daily	Yes	No	Yes		Yes	25000	0	7	0	1	0	25008	
1918	CC4294					80000 to 110000		Excepted packages - Normal cardboard packaging and cartons.	daily	Yes	No	Yes		Yes	11000	0	7	0	1	0	11008	
1289	CA4469					75000 (approx)		Boxed and polarised	240	Yes	Yes	Yes		Yes	7500	2	5	0	0	0	7507	
218	AT3768					>50000		Excepted Packages (UN2910)	Weekly	Yes	No	Yes		Contracted out	5000	0	10	0	1	0	5011	
381	BH9051					50000		Single boxed alarm units.	250 (approx)	Yes	Yes	Yes		Yes	5000	0	5	0	0	0	5005	
1430	CB3942					up to 20000		UN2911 Excepted Packages.	50-100	No	N/A	Yes		Yes	2000	0	2	1	1	0	2004	
2066	CC4176					11000		Excepted package (Class 7 - UN2311)	Daily	Yes	No	Yes		Yes	1100	0	7	0	1	0	1108	
1344	CB0790					up to 8000		Manufacturers cardboard packaging	Not given	No	N/A	Yes		Check	800	2	5	1	1	0	803	
1397	CB2636					up to 8000		N/A	Monthly	No	N/A	Yes		Yes	800	0	1	1	1	0	803	
241	AZ7777					3500		"all transport accepted packages". (suspect this means "Excepted")	Weekly	Yes	Yes	N/A		Yes	350	0	5	0	0	2	357	
2003	CC6050					3000*		UN2911 Radioactive Material Excepted Packages (and limits).	4 monthly	Yes	Yes	Yes		Yes	300	0	1	0	0	0	301	
206	AE5544					3000 (approx)		Do not transport RAM	N/A	Yes	N/A	Yes		No	300	0	0	0	0	0	300	consignors
619	BT1657					2300		Excepted Packages in fibreboard boxes. Radioactive sources are all serialised.	120-180	Yes	Yes	Yes		Yes	290	0	3.6	0	0	0	293.6	
990	BZ1447					2500 (max)		Do not transport RAM	N/A	N/A	N/A	Yes		Check	250	0	1	1	1	0	253	assumptions made.
747	BT5629					2161		Excepted closed source Class 7 (UN2910 and 2311).	2 to 4	No	N/A	Yes		Yes	216.1	0	1.5	1	1	2	221.6	
934	BT6826					2000 (approx)		Exempt.	(see notes)	Yes	Yes	Yes		Yes	200	0	15	0	0	0	215	
878	BT1271					2000		Cardboard box (100max per vehicle)	daily	No	N/A	Yes		Yes	200	0	7	1	1	0	203	

'Actual' Risk (following inspection)

- Non-compliances were recorded – 'actual' risk was the sum of non-compliances.
- Correlation with hypothetical risk was not great – you might as well have tossed a coin!
- Re-consider...

Spreadsheet Observations

- Inspectors may not be as consistent as we'd like! Different thresholds for
 - safety; and
 - non-compliance.
- RPAs and DGSA's were (probably) getting wise to our inspections;
- We maybe should have asked slightly different questions in the original questionnaire.

What did we do next?

- Continued with inspections but with a focus on carriers, who were an unknown quantity.
- Applied weightings to the non-compliances (based on expert opinion).
- Re-analysis...

Latest analysis

- 40% show good correlation;
- 30% show reasonable correlation;
- 30% show poor correlation.

Future work

- Inspector training to ensure consistency;
- Extend risk model to account for Carriers;
- Amend risk model to account for industry sectors?
- Analyse non-compliances and use for education/dissemination purposes.