# Testing and Evaluation Protocol for Alarming Personal Radiation Detectors for Homeland Security

T&E Protocol N42.32, 2010

Version 2.02

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# Testing and Evaluation Protocol Alarming Personal Radiation Detectors for use in **Homeland Security**

#### 1. Scope

This document establishes the protocol for testing alarming personal radiation detectors based on the performance requirements established in ANSI N42.32, "American National Standard Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security."

#### **2.** References

This protocol shall be used in conjunction with the following documents:

[R1] ANSI/IEEE N42.32, "American National Standard Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security."

[R2] ANSI/IEEE N42.42, "Data format standard for radiation detectors used for homeland security."

[R3] NIST Handbook 150:2006, NVLAP Procedures and General Requirements

[R4] NIST Handbook 150-23:2007 (DRAFT) NVLAP Radiation Detection Instruments

## **3.** Compliance Level Information

Instrument under test might meet all the requirements listed in the ANSI/IEEE N42.32 standard. Therefore, different agencies developed documents describing the compliance levels required for particular applications of the instruments under test. An example of such compliance level requirements is those required by the Graduated Rad/Nuc Detector Evaluation and Reporting (GRaDER) program. For this program, information can be found in the "Compliance Level for GRaDER Instrument Performance" document located at http://www.dhs.gov/GRaDER .

#### 4. Test and evaluation steps

It is recommended that testing laboratories perform the tests listed in this protocol in the following order:

- -Check all items listed in the general requirements
- -Perform the radiological tests
- -Perform the temperature and humidity tests
- -Perform the entire electrical and electromagnetic test except the Electrostatic Discharge (ESD) test
- -Perform the impact and the vibration tests
- -Perform the moisture and dust test
- -Perform the ESD test
- -Perform the drop test, as required



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Excel template sheets are provided by NIST to the testing laboratory to guarantee that all data required is being provided in the test report.

# 5. Recording test results

This Test and Evaluation protocol contains data sheets that shall be used to record and report all test results. Each data sheet is associated with a specific section(s) of the referenced ANSI standard, N42.32. An electronic version of the data sheets is provided in the form of spreadsheets that may be used to record and report the results of the tests. These spreadsheets were verified and validated (V&V) using Microsoft Excel 2007 (compatibility mode).

Instrument status shall be recorded on the "Test Summary" sheet as testing is performed. The comment section in each data sheet shall be used to record changes to the test requirements and methods listed in the ANSI standard. The comment section shall also include the rational of the changes.

## 6. Test report

A test report summarizing the results of the test shall include the following sections:

- a. Laboratory equipment information:
  - 1. Identify all participating laboratory facilities. Include points of contact names, mailing address, telephone number, and electronic mail addresses.
  - 2. Identify the tests performed in the different facilities.
  - 3. List all supporting equipment name, model number and last day of calibration used for each test.
- b. Test equipment information :
  - 1. Include manufacturer name, instrument model, instrument serial number, software and firmware version identification, and last day of calibration.
  - 2. List the operating modes and parameter setting of the instrument and accessory kit(s) used in each test.
- c. Data sheets:
  - 1. The data sheets listed in this document shall be completed and provided as part of the report.
  - 2. Include changes to the ANSI standard test requirements or methods and rational to the changes.



#### 7. Guidance for testing ANSI N42.42 data format requirements

The standard associated with this Test and Evaluation Protocol requires verification that an output data file is created that complies with ANSI/IEEE N42.42 standard requirements. The range of complexity of the N42.42 compliant instrument output file is extremely broad. Data output files from these instruments are simple files that can be checked manually using a text editor such as Notepad or WordPad. These files can also be verified using additional tools. In principle, all data output files that meet ANSI N42.42 can be verified manually using a text editor as these files are XML files. File reading software, such as Altova XMLSpy® 2009 Standard Edition can also be used for manual viewing and validating of structure and content.

N42.42 schemas can be used to validate the file format as specified in the ANSI/IEEE N42.42 standard. These schemas are available at the NIST web site <a href="http://physics.nist.gov/Divisions/Div846/Gp4/ANSIN4242/xml.html">http://physics.nist.gov/Divisions/Div846/Gp4/ANSIN4242/xml.html</a>.

There are several XML validators that can be used to verify the XML structure of the N42.42 compliant instrument output file. Examples of these validators can be found at <u>http://www.xmlvalidation.com/</u> or http://validator.w3.org/.

#### 8. Considerations

The standard establishes exposure rates for test in Roentgen per hour (R/h). When testing instruments that read in rem per hour, the test field shall be in rem/h instead of R/h. Refer to the "Units and Uncertainties" section in the standard for additional information.



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	Detecto	ors for Homela	nd Security	2010-11-09		2.02	4 of 74
		Test	Summary	Sheet			
			, ANSI N42.3	32			
Manufacturer:					_		
Model:	: 						
	Serial#		Serial#		Serial#	ŧ	
Test Number	Date	Status	Date	Status	[	Date	Status
5.1	<u> </u>						
5.2					_		
5.3					_		
5.4	}				_		
5.6							
5.7							
5.8							
5.9							
5.10	ļ						
5.11					_		
5.12							
5.13							
5.14							
5.16	1						
6.2	1				1		
6.3							
6.4							
6.5	ļ						
6.6					_		
6.7							
6.8							
0.9 7 1							
7.2							
7.3			1				
7.4.2							
7.4.3							
7.5							
8.1					_		
8.2					_		
8.3					-		
0.4 9 1							
9.2	1		1				
9.3	1						
10.0			Same a	s Section 5.2			
Comments:	:						
			_		_		



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			Pr	e-Test					
		Dat	a She	et and	Rep	ort			
					•				
Instrument:									
Model:						Seria	Number:		
Date Performed:				_		Test	Location:		
Requirement:	Verify th	nat the	manufac	turer suppli	ed an o	operatio	on and mair	ntenance ma	anual
	contair	ing th	e informa	tion listed b	elow.				
Note:	Comm	ents a	re require	ed when the	require	ement	s not verifie	d.	
			Те	st Results					
	Requ	ireme	ent			_	Yes		No
Operating instructions and i	restricti	ons							
Electrical connection scher	natic								
Troublesbooting guide									
Description and protocol for	comm	unicat	ion meth	ode of trans	mittin	hne n			
receiving data	comm	unicat	lon meth		SIIIILIII	y anu			
Contact information for the	manufa	cturer	including	name, ado	dress.				
telephone #. fax #. email ac	ldress.	etc.		,,					
Power supply requirements	,								
Recommended operational	parame	ters s	such as: o	detector res	sponse	and			
false alarm probability									
Complete description of sys	stem or	unit							
Enclosure specification clas	ssificati	on					L		
Inclusion of any hazardous	materia	I that	may requ	uire addition	nal		11		1.1
regulation									
Description of data analysis	softwa	ire and	d radionu	clide identif	fication	1			
procedure	1				. '1		••		
Description of operation and	a pertorr	mance	e of the s	ystem or u	nit		ы		
Comments:	· · · ·			1					
Completed by:							Date:		
Reviewed by:	L,						Date:		



N42.32

		(	Controls			
	N42.	32 Data	Sheet Se	ction 5.1		
Manufacturer:						
Model:				Serial Number:		
Requirement:	Controls shall be	clearly ident	tified easily one	erable under condi	tions of expect	ed use and
Nequirement.	adequately protect	cted from ac	cidental operation	on.		
Note:	Comments are re	quired when	the requiremen	t is not verified		
Note:						_
					Ve	rifv
	1st Surface			·	Yes	No
			Did the in	strument turn off?		
	Did the instrumer	nt change m	ode of operation	of configuration?		
				·	Ve	erify
	2nd Surface		Did the in	strument turn off?	res	NO
	Did the instrumer	nt change m	ode of operation	of configuration?		1
		<u> </u>		5		
	and Surface				Ve	erify No
			Did the in	strument turn off?	163	
						-
	Did the instrumer	nt change m	ode of operation	of configuration?		
				1		
		·	•		Ve	rify
	4th Surface		Did the in	strument turn off?	Yes	No
			Bid the in			
	Did the instrumer	nt change m	ode of operation	of configuration?		
				1 1		
					Ve	rify
	5th Surface				Yes	No
			Did the in	strument turn off?		
	Did the instrumer	nt change m	ode of operation	of configuration?		
			-			-

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					Ver	ify
	6th Surface		Yes	No		
	Did the instrumen	it change mo				
		Ver	ify			
	Controls	Yes	No			
		Ar	e the controls cl	early identified?		
		-				-
Comments:						
Performed by:				Date:		
Deviewed hw				Datas		[
Reviewed by:				Date:		1



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		Doc	cumentation							
		N42.32 Dat	ta Sheet Secti	ion 5.2						
Instrument Tested:					Te	st Equipm	ent Used:	N/A		
Date Performed:							S/N:		1	
Requirement:	<b>10.1 Type t</b> The manufa	est report acturer shall provide a report c	overing the type tests p	performed in accordance	with the requ	uirements o	f this standa	ard.		
	10.2 Certifi The manufa — Contacts — Type of ii — Range o — Reference — Location — Response —	icate acturer shall provide a certifica s for the manufacturer including nstrument, detector, and types of exposure rates the instrumer ce points and reference orienta and dimensions of the sensit se of the instrument to differen of tests for accuracy, linearity, i and dimensions of the instrum upply (battery) requirements. of tests under environmental co of electrical and mechanical te tion and maintenance manual acturer shall supply an operation in structions and restrictions	te or other documentat g, but not limited to, nai of radiation the instrur nt is designed to meas ation for radiation sourd tive volumes of the dete t appropriate radiation and lower limit of detect ent. conditions. ests. Is onal and maintenance	tion containing at least th me, address, telephone in ment is designed to measure. ce used for calibration. ectors. energies. ction.	e following i number, fax sure. sure follow	nformation: number, e-r ving informa	nail address	s, etc. user:		
Note:	- Troubles	shooting guide.	rement is not verified.							

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Requirement	Yes	No
The manufacturer provides report for type test results?		
Verify that manufacturer contact information is available		
Verify that the type of instrument is described in the manual		
Verity that the exposure rate information is available in the manual		
Varify that reference point and reference orientation is describe in manual		
Verify that the location and dimensions of the sensitive volumes of the detectors is describe in the manual		
Verify that the radiation energy region is described in manual		
Verify that information on accuracy, linearity and lower limit of detections		
Verify that information on weight and dimensions of instrument is available		
Verify that information power supply (battery) requirements is available		
Verify that information that test results under environmental conditions is available		
Verify that results of electrical tests are available		
Verity that results of mechanical tests are available		
The menufacturer provides exercise instructions?		
The operating manual provides electrical diagrams?		
The operating manual provides list of spare parts?		
The operating manual provides instrument specifications?		
The operating manual provides a troubleshooting guide?		



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			Ge	neral Re	quirement	s						
	N42.32	Data Shee	et Sections 5.	3 to 5.4 a	and 5.10 to	5.14 a	nd 5.16					
Manı	facturer:											
	Model:			-	Serial Number:							
F	irmware:											
Requir	ements:											
	5.3 Manufa The followin	cturer, Model and ng shall be record	<b>l Serial Number</b> ed: manufacturer's na	me along witl	h the model, seria	ıl number a	and firmware n	umber of th	e instrume	nt and dete	ctor, if separ	ate.
	5.4 Type of The followir	Radiation Detect	<b>or</b> ied and recorded: type	ofinstrument	t (gamma only or	gamma/ne	utron) and the	radiation de	etector type	s used (e.g	., Nal, Csl, G	GM).
	5.10 Size The overall thickness, u	dimensions of the unless it is incorpo	e instrument, excludin prated into another de	g any clip, reta vice.	aining device or e	dernal alar	m, shall not ex	ceed 20 cm	in length, ′	10 cm in wi	dth and 5 cm	ı in
	<b>5.11 Mass</b> The mass o	of the complete in	strument shall not exc	eed 400 g.								
	5.12 Refere The instrum The instrum point to indi	ence point markir nent shall have rei nent shall have an cate proper orient	ng ference points on the additional reference tation.	ront or back, a point indicatin	and on the side in g its orientation w	dicating the	e effective cent to the wearer.	er of the de The prese	tector. nce of a clip	o may be us	ed as the re	ference
	5.13 Clips Means sha the detecto 5.14 Explo The manufa provided. (	and lanyards ill be provided to or, alarm type, ar osive atmosphe acturer shall stat Certification is ba	securely fix the instr id display. res e as to whether the i ised on UL-913-2002	ument to the nstrument is	user (for examp certified for use	e, a clip, r in explosiv	ing, or lanyard e atmosphere	l), with atte s. If certifi	ention giver cation is cl	n to the neo	cessary orie	entation of I shall be
	5.16 Data If the instru using wirele	Format Iment transmits ( ess data transfer	wireless, infrared, et techniques. When u	c) or stores d ised, wireless scribed in the	lata, the data for s techniques sha e technical mani	mat shall t Il have the	be in XML. Co ability to be e freely distribut	nsideration encrypted.	should be	given to d	ata security	when
	NOTE – Th	e data format is	defined by ANSI N42	2.42.								
	Photograp Photograph	oh h the instrument	and retain the photo	in the record.	1		I					
Note:	Comments	are required whe	en the requirement is	not verified.								
	lu at		Commo only			Cam	ma/Nautrani		1			
	instr	ument rype:	Gamma only	·		Gam	ma/neutron:					
	Gamma De	etector Type:										
	Neutron D	etector Type										
	Heution De	steetor rype.										
		Size:	Widt	h	Length		Thickness		(cm)			
		Weight:		1		(grams)						
		. <b>.</b> .										

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DEVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	<b>PREPARED BY:</b> DIV682		
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						Yes		No		
Are	the reference p	oints in the	front or back	and on the	side indicated?					
		Inst	trument provid	des a mean	to fix it to user?					
						1	r			
			Is the v	wearing orie	ntation marked?		L			
	la tha in t	u una o unt 1-	antificed former	in avelas'	n atmaarter o					
	Is the instr	e atmospheres?								
			1		1					
lf a sufficient for sur										
If certified for us	e in explosive a	tmosphere	s, has docum	iented proof	being provided?					
	malianaa baaa			1						
	ompliance base	a on testing	g done in acco	Sidance with	1 UL-913-2002 ?					
	1	1	1		1	1	1	1		
Data Format										
Data Format						Vaa	NI/A	Na		
Deer	the meniter he	we the chili	hi ta transfar	data ta an a	wternel device?	res	IN/A	INO		
Does	s the monitor ha	we the abili	ty to transfer	data to an e	external device?					
					hi dina ati an alQ	r		1		
			is the tr	ansmission	pi-directional?		l			
				<u> </u>	· · ·	1				
is the transfer	based on comm	noniy availa	ible technolog	gy? (e.g. Etr	nernet, wireless,					
					USB, RS-232					
		<del></del>				1				
lft	he transfer is w	ireless, doe	es it have the	ability to en	crypt the data?					
						1	1	1		
	Is the	transfer pro	tocol describ	ed in the te	chnical manual?					
						•	-			
	ls	the data fo	rmat describe	ed in the tec	hnical manual?					
				Is the data	format in XML?					
The data format complies with ANSI N42 42 requirements?										
	The dat	a ionnai co	mplies with A	The data format complies with ANST N42.42 requirements :						
	The dat	a ionnai co	mplies with A	(11311142.42	requirements?					
 Did t	he manufacture	er provide pr	oprietary soft	ware for dat	a interpretation?					
 Did t	he manufacture	r provide pr	oprietary soft	ware for dat	a interpretation?					
Did 1	he manufacture	r provide pr	oprietary soft	ware for dat	a interpretation?					
Did t	he manufacture	r provide pr	oprietary soft	ware for dat	a interpretation?					
Did 1	he manufacture	er provide pr	oprietary soft	ware for dat	a interpretation?					
Did f	he manufacture	r provide pr	oprietary soft	ware for dat	a interpretation?					
Did f	he manufacture Record default	r provide pr	oprietary soft	ware for dat	a interpretation?					
Did 1	he manufacture Record default	gamma ala	oprietary soft	ware for dat	a interpretation?					
Did 1	he manufacture Record default Record default	gamma ala neutron ala	oprietary soft	ware for dat	a interpretation?					
Did 1	he manufacture Record default Record default	gamma ala	oprietary soft	ware for dat	a interpretation?					
Did t	he manufacture Record default Record default	gamma ala	oprietary soft	ware for dat	a interpretation?					
	Record default	gamma ala neutron ala	oprietary soft	ware for dat	a interpretation?					
Did t	he manufacture Record default Record default ma alarm thres	gamma ala neutron ala	oprietary soft	ware for dat	a interpretation?					
Did f	Record default Record default ma alarm thres	gamma ala neutron ala	urm threshold	ware for dat	a interpretation?					
Did t	Record default Record default ma alarm thres	gamma ala neutron ala hold used c	urm threshold urm threshold urm threshold during testing	ware for dat	a interpretation?					
Did t	Record default Record default ma alarm thres	gamma ala neutron ala hold used c	urm threshold urm threshold urm threshold during testing	ware for dat	a interpretation?					
Did t	Record default Record default ma alarm thres	gamma ala neutron ala hold used c	urm threshold urm threshold urm threshold during testing	ware for dat	a interpretation?					
Did t	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold uring testing	ware for dat	a interpretation?					
Did t	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold uring testing	ware for dat	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold uring testing	ware for dat	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold during testing during testing	ware for dat	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c	urm threshold urm threshold during testing during testing	strument Pł	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c	urm threshold urm threshold urm threshold during testing during testing	strument Pl	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold urm threshold during testing during testing	strument Pt	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold urm threshold during testing during testing	strument Pl	a interpretation?					
Comments:	Record default Record default ma alarm thres ron alarm thres	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold urm threshold uring testing uring testing	strument Pl	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres strument operation	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold urm threshold during testing luring testing	strument Pt	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres strument operati	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold during testing during testing	strument Pt	a interpretation?					
Record gam	Record default Record default ma alarm thres ron alarm thres strument operation	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold urm threshold during testing during testing	strument Pl	a interpretation?					
	Record default Record default ma alarm thres ron alarm thres strument operation	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold urm threshold during testing during testing	strument Pl	a interpretation?					
Did f	Record default Record default Record default ma alarm thres ron alarm thres strument operat	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold uring testing uring testing	strument Pl	a interpretation?					
Did t	Record default Record default ma alarm thres ron alarm thres strument operati	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold during testing during testing	strument Pl	a interpretation?	Date:				
Record gam	Record default Record default ma alarm thres ron alarm thres strument operati	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold during testing during testing	strument Pl	a interpretation?	Date:				
Did t	Record default Record default ma alarm thres ron alarm thres strument operati	gamma ala neutron ala hold used c hold used c	urm threshold urm threshold during testing during testing	strument Pł	a interpretation?					



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				Disp	olays							
			N42.32 D	ata Si	neet Section	5.5						
Instrument Tested:					Test Equipmen	t Used:						
					C/N-							
Date Performed:					5/N:							
Requirement:	Radiation	levels shou	ld be displayed u	sing one	or more of the follo	wing me	thods:					
	<ul> <li>Digital Display: The instrument directly displays the measured exposure or dose rate (e.g. μR/h, μG)</li> <li>Unit-less Display: The instrument displays a numerical value that may be proportional to the exposure but is not explicitly reported as the exposure or dose rate.</li> <li>Non-numerical Display: The instrument displays a non-numerical indication of the intensity of the rad (e.g., bar-graph, colored LEDs).</li> <li>The display shall be readable in low light levels (&lt;150 lux) and high light levels (&gt;10000 lux).</li> </ul>											
	Note:	Comments	are required whe	en the rea	quirement is not ver	ified.						
								Ve	rify			
								Yes	No			
							Is the display backlit?					
						Is the d	isplay continuously lit?					
					ls the dis	play rea	dable in low light level?					
					Is the disp	lay read	lable in high light level?					
<b>_</b>			1.00		0.1							
Display	LED		LCD		Other							
Diam lass from a					Disital		Other					
Display type	Unit-less		Non-numerical		Digital		Other					
Display range												
Display lange												
For Digital or numer	ical dienta	ivs record	units	Unite								
		iya recolu		Units								
Comments												
Some of the second seco												
Perfo	ormed by:						Date:					
Revi	ewed bv:						Date:					
	· <b></b>											



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	Effe	ective Ran	ge of Meas	urement o	r Indicatio	on						
		N42.3	2 Data She	et Section	5.6							
Instrument Tested:				Test Equ	ipment Used:							
Serial Number:												
Requirement:	The effectiv	e range of meas	surement or indica	ation shall be sp	ecified by the n	nanufacture	er and shall be	e from 5 μR/h				
	10 1101 1655											
	The instrument response over the effective range specified by the manufacturer shall be tested.											
Nata	Commente		an the securit									
Note:	Comments	are required wit		nt is not vernied.								
							Va	rify				
							Yes	No				
							103	110				
		For	gammas: is the	effective range a	t least 5 uR/h t	o 2 mR/h?						
			<u>g</u> a		· · · · · · · · · · · · · · · · · · ·							
For gammas: what	at is the effe	ctive range of m	easurement as st	ated by the mar	ufacturer? (inc	lude units)						
;												
	For ga	mmas; what is	the display range	shown by the in	strument? (inc	lude units)						
				,	<u>_</u>	,						
For neutrons; what	at is the effe	ctive range of m	easurement as st	tated by the mar	nufacturer? (inc	lude units)						
					·	·						
	For ne	utrons; what is	the display range	shown by the in	strument? (inc	lude units)						
					·	·						
Energy range for gamma:												
Energy range for neutrons:												
Comments:												
Performed by:						Date:						
Reviewed by:						D - 4 -						



	<b>F I A</b>				-		
	N4	12.32 Data	a Sheet S	Section 5	.7		
Manufacturer:							
Model:		Seri	al Number:				
Requirements:	The instrument s	shall:					
	<ul> <li>Include a displa different lighting</li> <li>Include controls</li> <li>Be capable of a</li> </ul>	ay that is easily conditions s that are user- operation if the	y readable ow friendly for ro user is weari	er the required utine operatio ng gloves	d temperature	e range and une	der
Note:	Comments are re	equired when th	he requiremer	nt is not verifie	ed.		
						Yes	N
Controls						(Choos	e One
1 Was the o	n/off switch easy	to find?			ł	,	
2 Were all th	ne controls labele	d?					
3 Were all th	ne labeled control	s easy to read/	/interpret?				
4 Were all th	ne controls easy t	to operate with	out gloves?				
5 Could all th	he controls be op	erated with glov	ves?				
						Yes	N
Interface						(Choos	e One
	ay readable in lov	v light levels?					
6 Was displa							
6 Was displa 7 Was displa	ay readable in hig	h light levels?					
6 Was displa 7 Was displa 8 Did the dis	ay readable in hig play contain abb	h light levels? reviations or icc	ons? (If no sk	kip next quest	ion)		

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		Yes	No
	Operation	(Choos	e One)
10	Did the instrument convey its state-of-health at start-up, e.g. battery life, detector		
	present and working, memory available, and mode of operation?		
11	Did you have to refer to the instruction manual more than once to complete the test?		
12			
12	Was the menu structure simple and intuitive?		
13	···· · · · · · · · · · · · · · · · · ·		
10	At any time during the test did the instrument prompt you for action?		
14	Did the instrument issue any cautions or warning? (such as alarm, alarm type, over-		
	range and low battery indication ) (If no. skip next question)		
15	Did the instrument provide information on the nature of the equations or warning?		
10			
	Test Results - Low Light Levels (<150 lux)		
		Yes	No
	Turn on the instrument and write that it is working properly (e.g. the battery is	100	110
40	sharred the detector is present and working moment is available)		
18	charged, the detector is present and working, memory is available)		
19	Calibrate instrument (if necessary)		
20	Make an exposure rate measurement		
21	Turn off the instrument		
	Test Desults - Lligh Light Laugle (5 40000 luu)		
	Test Results - High Light Levels (>10000 lux)	V	N.I
		res	NO
	Turn on the instrument and verify that it is working properly (e.g. the battery is		
22	charged, the detector is present and working, memory is available)		
23	Calibrate instrument (if necessary)		
24	Make an exposure rate measurement		
25	Make an identification (of a single radionuclide) and save the data		
26	Turn off the instrument		
~	ommente:		
U	oninients.		
Perf	Date:		
Rev	iewed by: Date:		



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				Audib	e Alarm				
		N	42.32 [	Data S	heet Secti	on 5.8			
Manu	ufacturer:								
	Mar dala				O a mi a l	Neurolean			
	Model:				Serial	Number:			
Requi	rements:	1) The frea	uencv of a	n audible a	larm shall be with	in the range of 1000	Hz to 4000	Hz.	
		2) Where a	an intermitt	ent alarm i	s provided, the sig	gnal interval shall not	exceed 2 s		
		3)The A-we	eighted ala	rm volume	at a distance of 3	0 cm from the alarm	source sha	ll be at leas	st 85 dB(A)
		and shall r	not exceed	100 dB(A)					
		4) If the au	dible alarm	can be di	sabled, the instrur	nent shall have a vibr	ration or a v	isual alarm	. It shall
		not be pos	sible to dis	able all ala	arms at the same	time.			
	Ambient C	onditions.		°C	%RH		in HG		
		onanions.		•	/////				
Test E	auipment:								
	1								
Instrumen	t Mode of	operation							
Note:	Comments	are require	ed when the	e requireme	ent is not verified.				
				Maa	ouromont Do				
				iviea	surement Res	<u>suits</u>			
			Alarm vo	lumo			Eroquono	 	
				luille			Frequenc	,y	
			dB(A)	1			Hz	1	
		1		1		1			
		2				2			
		3				3	3		
		4				4	+		
		5				5	ō		
		6				6	j		
		7				7	·		
		8				8	3		
		9				9			
		10				10	#DN//01		
		Mean	#DIV/0!			Mean	#DIV/0!	ПZ Ц-	
			#DIV/0! #DIV/0!				#DIV/0!	112	
			- TTI / V / V /					-	-
		001 /0							
		001 /0							

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								Ve	rify
								Yes	No
				Is the ala	rm frequenc	y within 1000 to	o 4000 Hz?		
	Wher	re an interm	nittent alarm	is provideo	d, is the int	erval less than 2	2 seconds?		
	ls th	ne alarm vol	ume at a di	stance of 3	30 cm withii	n 85 dB(A) and	100 dB(A)?		
			Doe	s the instru	ument have	a vibration or vis	sual alarm?		
	Doe	es the instru	ument have	preventive i	measures f	or disabling all t	he alarms?		
		1			i				
Re	cord alarn	n interval	(seconds):						
	Record vi	brational f	requency:			-			
Po	oord vieuo	Ingramate	are if any						
Re		i paramett	ers, ii aliy.						
С	omments:								
		-							
Perf	ormed bv:					1	Date:		
	<b>j</b>								
Rev	iewed by:						Date		

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		Vibrat	ion Ala	arm					
	N42.3	2 Data S	Sheet	Sectior	า 5.9				
Manufacturer:							1		
Model:				Seria	I Number:				
Requirements:	1) If the ins wearer to a 2) The use connection	strument has an alarm cond of soft-sided between the	a vibration dition. carrying p e holder and	alarm, the v ouches is d d the instrur	vibration ala iscouraged nent such t	arm shall ha . If a holde that there is	ave sufficien r is used, t s no loss o	nt intensity here should f vibration in	to alert the be a rigid tensity to
	the user. 3) The inte vibration m	nsity of the v otor used by	ibration at f the instrur	the surface nent should	of the instru rotate betv	ument shal veen 9000	be greate and 11000	r than 0.8 g. rpm.	The
Note:	Comments	are required	when the i	requirement	is not verif	ied.			
Ambient C	Conditions:		°C		%RH		in HG		
Test Equipment:									
Instrument Mode of	oporation								
mad ament wode of	operation								
							Ve	erify	
							Yes	No	
	Instrume	ent and Mo	otor Verif	fication				•	
			Verif	y that new b	atteries are	e installed?			
				-					
		Ν	Aotor rotatio	on between	9000 and 1	1000 rpm?			
				W	hat is the i	motor rpm?			

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		<u>ment Results</u>	Meas	
Intensity (				Intensity (g
1	1			1
2	2			2
3	3			3
1	4			4
5	5			5
7	6			7
3	8			8
9	9			9
	10			10
/ #DIV/0!	Mean intensity			nsity #DIV/0!
) ( a nifi a d				)/a sifi a d
Yes				Yes N
?	ing greater than 0.8 g?	Each measured		8 g?
	1 1 1			
			Comments:	
:	Date:		erformed by:	ate:
•	Date:		Reviewed by:	ate:



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Detectors for Homeland Security

	Batte	ery Lifet	ime				
N42	.32 Data	Sheet S	ection 5	.15			
Manufacturer:							
Model:		1		Serial Number:			
Radioactive Source Data:							
Ambient Conditions:		°C	%	RH	in HG		
Requirements:	1) Batteries us	sed shall be w	idely available	, not unique to the ir	nstrument,	and be repl	aceable in the
· · · · · · · · · · · · · · · · · · ·	field without th	ne use of spec	ial tools.	•	,		
	2) The batterie	es shall be ca	pable of poweri	ng the instrument ir	a non-alar	m state for	16 hours in a s
	µR/h field. Th	e batteries sh	all be capable	of powering the inst	rument alar	m continuc	usly for 30
	minutes.						-
	3) The instrum	nent shall have	e a low battery	indicator.			
Note:	Comments are	e required whe	en the requirem	ent is not verified.			
							<u>.</u>
Non-alarming test after 16 ho	urs of operatic	n					
				Acceptanc	e range:		
	Pre-test	After 16					
	response	hours		low (-15%)	#DIV/0!		
Reading 1			(add units)				
Reading 2				high (15%)	#DIV/0!		
Deading 2							
Reading 5							
Reading 3 Reading 4							
Reading 3 Reading 4 Reading 5							
Reading 3 Reading 4 Reading 5 Reading 6							
Reading 3 Reading 4 Reading 5 Reading 6 Reading 7							
Reading 3 Reading 4 Reading 5 Reading 6 Reading 7 Reading 8							
Reading 3 Reading 4 Reading 5 Reading 6 Reading 7 Reading 8 Reading 9							
Reading 3 Reading 4 Reading 5 Reading 6 Reading 7 Reading 8 Reading 9 Reading 10							
Reading 3 Reading 4 Reading 5 Reading 6 Reading 7 Reading 9 Reading 10 Average	#DIV/0!	#DIV/0!					
Reading 3 Reading 4 Reading 5 Reading 6 Reading 7 Reading 8 Reading 9 Reading 10 Average Standard dev	#DIV/0!	#DIV/0! #DIV/0!					
Reading 3 Reading 4 Reading 5 Reading 6 Reading 7 Reading 8 Reading 9 Reading 10 Average Standard dev COV %	#DIV/0! #DIV/0!	#DIV/0! #DIV/0! #DIV/0!					
Reading 3 Reading 4 Reading 5 Reading 6 Reading 7 Reading 8 Reading 9 Reading 10 Average Standard dev COV %	#DIV/0! #DIV/0!	#DIV/0! #DIV/0! #DIV/0!					

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	What is the	voltage when t	he low batter	y indication	activates?			
						Yes		No
Ŵ	as the low batte	ry indication dis	splayed after	16 hours of	operation?	.00		
		,						
	D	id the instrume	nt alarm with	low battery	indicated?			
		Did the alarm	sound continu	Lously for 3	0 minutes?			
		What was the	he gamma ex	posure rate	for alarm?			
	And the best		1					
	Are the batt	eries replaceat		e use of spe	ecial tools?			
	F	loos the instrum	nont have a l	ow battony i	ndication?		-	
	L			ow ballery i				
		Specify ba	attery type an	nd number o	f batteries.			
	<b>0</b>							
	Comments:							
	Performed by:						Date:	
	Reviewed by:		1	1			Date:	



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Rate of False Alarms										
N42.32 Data Sheet Section 6.2										
	Manufacturer:									
	Model:				Seri	al Number:				
R	equirements:	The false ala per 10h wher	rm rate for gamma n operated in a sta	and neutron ble backgrour	(when applicand environmer	able) shall be nt.	less or eq	ual than on	e alarm	
Note:	Comments are	required wher	n the requirement is	s not verified.	1					
Δmbi	ent Conditions		°C		%RH		in HG			
	ent conunions.				70111					
Gamma Ala	arm Threshold:				Instrume	nt Mode of	operation			
Neutron Ala	arm Threshold:									
Gamn	na Background r	neasurement		µR/hr						
Neutr	on Background r	neasurement		(add units)						
					Yes	No				
For gammas; d	id the instrument	t alarm more	than once over the	test period ?						
If applicabl	e, did the neutro	n alarm more	than once over the	e test period?						
Reco	rd the number of	f gamma alarr	ns during the test:							
Reco	rd the number of	f neutron alarr	ns during the test:							
	Comments:									
	Performed bv:						Date:			
	Reviewed by:						Date:			



	Tin	no to Ala	rm: Dhot	one			
	N42.3	2 Data Sr	neet Sectio	on 6.3			
Manufacturari							
Wanuacturer.							
Model:			Serial Number:				
Requirement:	The false a	alarm test shall	be completed b	efore this time-to-	alarm test. The ala	arm set point	
	shall be th	e same as the	one used for the	false alarm test.			
	<b>_</b>						
	The instru	nent shall alarr	n in ≤2 s after ex	posure to an incr	ease in the amble	nt radiation	
	neriod of n	ot more than 0	n). The increase	in the amplent fa		be over a	
			.0 3.				
	Note:	Comments are	e required when t	the requirement is	not verified.	!	
		Mea	surement Re	<u>sults</u>			
Background Fie	ld (Cs-137)		µR/hr	arm Threshold		µR/hr	
Background Field	d (Am-241)		µR/hr				
Background Fie	ela (Co-60)		µr/nr	Instrument Mo	ode of operation		
Record in table if instru	ment alarm	ed or not withir	n 2 seconds. It is	s expected a Yes/	No (y/n) entry for	10 readings	
		Cs	<b>⊱137</b>	Am	-241	Co	-60
		Time to	alarm ≤ 2s	Time to a	alarm ≤ 2s	Time to a	alarm ≤ 2s
		Yes	No	Yes	No	Yes	No
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8		T				
	9		1				
	10						

NST
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				Vaa	No	
				ies	NO	
Did the instr	rument alari	m within 2 seco	nds for Cs-137?			
Did the instru	ument alarn	n within 2 secor	nds for Am-241?			
Did the ins	trument ala	rm within 2 sec	onds for Co-60?			
Comments:						
Performed by:			Date:			
Reviewed by:			Date:			



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		T	ime to	o alarm	- Neut	tron			
		N42	.32 Da	ata Shee	t Secti	on 6.4			
Manufacturer:									
Model:			Seri	al Number:					
Require	ment:	The instrument shall ind instrument shall fulfill thi	licate the is conditic	presence of n on when tested	eutron radi d on a poly	ation when e: methylmetha	xposed to an unn crylate (PMMA) pł	noderated neur	tron field. The
	Note	Comments are required	1 when th	e requiremen	t is not ve	rified			
	Note.			e requirement		filled.			
								_	
Ambient Condi	tions:			<u>с</u>		%RH			
Test Equipment:									
Source Data:						Instrumer	nt Mode of ope	ration	
Background	Field			(add units)	Alarm	Threshold	(add	units)	
					<b>D</b> 14 .				
			Mea	asurement	Results				
Record in table if instru	ment a	larmed or not within 2 s	seconds.	It is expected	d a Yes/N	o (y/n) entry	for 10 readings		
				Cf-2	52				
				Time to ala	arm ≤ 2s				
			1	162	NU				
			2						
			3						
			4						
			5						
			6						
			7						
			8						
			9						
			10						

NST
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					Yes	No		
							_	
	Did the ins	strument alarm within 2	seconds	for neutron?				
							_	
Comments:								
Performed by:				Date:				
Reviewed by:				Date:				



# TEST AND EVA

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Detection o	of gradually i	increasi	ng gamma ra	adiation leve	els and Neut	ron detectio	n
	N42.32 Data Sheet Section 6.5						
Manufacturer:							]
Model:			Serial Number:				
	Requirement:	The instrum be caused v	ent's alarm threshol when a wearer is slo	ld shall not be affect wly approaching or	ted by slowly increation in the slowly increation is being approache	asing radiation leve ad by a radiation so	ls that may purce.
		The alarm s	nali activate within 2	2 seconds after the	Instrument reaches	the test position.	
Notor	Commonto oro rog	uired when t	ha raquirament in pr	at varified			
Note.	Comments are req			St vermed.			
Am	bient Conditions:		°C		%RH		in HG
Test Equipment:							
Source Data:							
Gamma B	ackground Field:		µR/h	Neutron B	ackground Field:		(add units)
Gamma	Alarm Threshold:		µR/h	Neutron	Alarm Threshold:		(add units)
Instrument M	lode of operation						

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Record in table if instrument	alarmed or not with	nin 2 seconds.	It is expected a Y	′es/No (v/n) ent	ry for 10 readings		_
					, · · · · · · · · · · · · · · · · · · ·		
			<u></u>	127	0	-252	_
			Time to a		Time to	-ZJZ	_
			Time to a		Time to		_
			Yes	NO	Yes	NO	_
		1					
		2					
		3					
		4					
		5					
		6					-
		7					
		, 8				+	-
		0				+	-
		9				+	-
		10					
			Vaa	Ne			
Did the instrument alar	m within 2 seconds	for gamma?	res	NO			
Did the institutient alar		lor gamma:					
Did the instrument alar	m within 2 seconds	for neutron?					
For Cs-137:							
ŀ	Record maximum ti	me to alarm:			seconds		
	Record minimum ti	me to alarm:			seconds		
For Cf-252							
F01 CI-232.	Record maximum ti	me to alarm:			seconds		_
	Record minimum ti	me to alarm:			seconds		
Comments:							
<b>.</b>			<b>_</b>				
Performed by:			Date:				
Poviowed by			Datas				
Reviewed by:			Date:			-	

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		<u>A</u>	<u>ccuracy - F</u>	hotons						
	N42.32 Data Sheet Section 6.6									
<b>N</b>										
Manufacturer:										
Model:		Serial Number:								
Poquiromon		vpoquro ratos, whon pr	ovided, shall be wit	$hin \pm 20\%$ of the conv	ontionally true volu	o of the applied				
Kequiremen	exposure rat	te using 137Cs.	ovided, shall be wit			e of the applied				
		5								
	For unit-less	displays, if the manuf	acturer provides a c	onversion table to co	onvert the displayed	I value to an				
	exposure rat	te the indicated value s	hall be with ±30% of	of the applied exposu	ure rate.					
Note	e: Comments a	are required when the n	equirement is not w	erified.						
		÷					÷			
Ambient Condition	s:	°C		%RH		in HG				
Ambient Condition	s:	°C		%RH		in HG				
Ambient Condition	S:	°C		_%RH		in HG				
Ambient Condition Test Equipment: Source Data:	S:	°C		%RH	lode of operation	in HG				
Ambient Condition Test Equipment: Source Data:	S:	<b>3</b> °		%RH	lode of operation	in HG				
Ambient Condition	S: Background	°C	μR/h	%RH Instrument N	lode of operation	in HG				
Ambient Condition Test Equipment: Source Data:	s: Background	°C	µR/h	%RH Instrument N at test location	lode of operation	in HG				
Ambient Condition Test Equipment: Source Data: Gamma Alar	s: Background m Threshold:	°C	μR/h μR/h	%RH Instrument N at test location	lode of operation	in HG				
Ambient Condition Test Equipment: Source Data: Gamma Alar	Background	°C	μR/h μR/h	%RH Instrument N at test location	lode of operation	in HG				
Ambient Condition Test Equipment: Source Data: Gamma Alar Maximum instrument	Background m Threshold: ange display	°C	μR/h μR/h (add unit as applic	%RH Instrument M at test location able to instrument)	lode of operation	in HG				
Ambient Condition Test Equipment: Source Data: Gamma Alar Maximum instrument 1 Calculate 20% 500	Background m Threshold: range display	°C	μR/h μR/h (add unit as applic	%RH Instrument M at test location able to instrument)	lode of operation	in HG				

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				Pate for 20%	Pate for 50%	Pate for 80%		
	Deserved as all a	dan Galda	une di fan te et in un D/h					
	Record radia	ition fields i	used for test in mR/n	0.00	0.00	0.00		
			1				(add instrument u	nits)
			2					
			3					
			4					
			5					
			6					
			7					
			8					
			9					
			10				1	
			Mean	#DIV/0!	#DIV/0!	#DIV/0!		
			Std dev	#DIV/0!	#DIV/0!	#DIV/0!		
			COV %	#DIV/0!	#DIV/0!	#DIV/0!		
			low (-30%)	0.00	0.00	0.00		
							_	
			high (+30%)	0.00	0.00	0.00		
							_	
Comments	S:							
Performed by	y:		Date:					
Reviewed by	y:		Date:					



#### TEP NO. TEST AND EVALUATION PROTOCOL

TEST AND EVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	<b>PREPARED BY:</b> DIV682	
TITLE: Alarming Personal Radiation Detectors for Homeland Security	<b>EFF. DATE</b> 2010-11-09	<b>REV.</b> 2.02	<b>PAGE</b> 31 of 74

			A	ccuracy -	Neutrons			
			N 42.3	2 Data She	et Section 6.7			
Manufacturer:								
Model:			Serial Number:					
Re	equirement:	NOTE—This	test is only required if	the neutron indic	ation is displayed in m	irem/h (or any subu	init of rem or Sv).	
		If the instrum	nent display is in cps o	or cpm or any othe	er unit, this test is not	required.		
		Displayed ne	eutron dose rate, when	provided, shall be	e within ±50% of the c	onventionally true va	alue of the applied	
		dose rate us	ing 252Cf.					
	Note:	Comments a	are required when the r	equirement is not	verified.			
			-					
Ambient	Conditions:		°C		%RH		in HG	
Test Equipment:								
0								
Source Data:					Instrument N	lode of operation		
		De elsenesse d		(add.usite)				
		Background		(add units)	at test location			
Na	utren Alerm	Thrachald		(add unita)				
NE	auton Alarm	i mresnold:		(auu units)				
Movimum ir	 	ngo dicplov		(add unit ac anal	inchin to instrument)			
	isa ument ra	nge uisplay		lang nunit as abbi				
Calculat	e 20% 50%	and 80% of	maximum instrumer	t range display	he			
Calculat	5 20 /0 , 30 /0,		maximum mou umer	it range displaye	54			

NST	TEST AND EVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	<b>PREPARED BY:</b> DIV682	
	TITLE: Alarming Personal Radiation Detectors for Homeland Security	<b>EFF. DATE</b> 2010-11-09	<b>REV.</b> 2.02	<b>PAGE</b> 32 of 74

			Rate for 20%	Rate for 50%	Rate for 80%	
	Dose rate	during test	0.00	0.00	0.00	(add units)
	Descrate	1	0.00	0.00	0.00	
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		Mean	#DIV/0!	#DIV/0!	#DIV/0!	
		Std dev	#DIV/0!	#DIV/0!	#DIV/0!	
		COV %	#DIV/0!	#DIV/0!	#DIV/0!	
Accepta	nce range:	low (-50%)	0.00	0.00	0.00	
		high (50%)	0.00	0.00	0.00	
Comments:						
						-
Performed by:			Data			
enormed by.			Date.			
Reviewed by:			Date			
			Suic.			



		C	ver-Ran	ge Re	sponse	•				
1			N42.32 Da	ata She	et Sect	ion 6.8				
Manufa	acturer:									
Model:					Seria	al Number:	1	1		
									_	
Requir	ement:	when exp manufactu overrange within 1 m	indication sha indication sha in when the ra	tion of the ll be displa diation fiel	instrument s iyed for the d is reduced	shall remain duration of t	at the main exposu	exposure rate ximum of tha re. The instru	t range, and	y the d an recover
	Note:	Comment	s are required	when the r	equirement	s not				
Ambient Con	ditions <sup>.</sup>		°C		%RH		in HG			
					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Test Equi	pment:									
Sourc	e Data:									
Instrument	Mode of	operatio	n							
	ineae ei	oporatio								
Manufactu	Manufacturer-Stated Max Exposu		posure Rate:		mR/h					
0	Over-Range Test Exposure Rate:				mR/h					
	0		Duratia		un in					
	Over-Rai	nge ⊢xpos	ure Duration:		min.					

NIST	TEST AND EVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	<b>PREPARED BY:</b> DIV682	
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								Ver	ify
								Yes	No
	Was an over-range indication displayed?								
				Did the	instrument r	ecover within	n 1 minute?		
		Did the i	ootrumont in	diaction ron	noin at tha n	ovinum of	the range?		
		Dia trie li			iani at the h		the range?		
	Rec	orded reco	overy time:						
	Comments:								
Per	Performed by: Date:								
Re	Reviewed by: Date:								


			Interf	erina lonizir	a Radiatio	'n			
			N	42.32 Data S	neet Sectior	n 6.9			1
	Man	nufacturer:							
	Model			Serial Number:					
	moder.			Genar Number.					
Re	quirement:	If the instru	ment has a	neutron detector, the	e neutron detector	shall be insensiti	ve to photon	radiation.	
	Note:	Comments	are required	d when the requireme	ent is not verified.				
Ambient (	Conditions:		°C		%RH		in HG		
Test E	Equipment:								
Sc	ource Data:								
Instrume	ent Mode of	operation							
				1				Ve	rify
									-
								Yes	No
								Yes	No
						Did the neutron al	arm go off?	Yes	No
					[ Were neutrons inc	Did the neutron al dicated during the	arm go off? exposure?	Yes	No
				If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the rron indication (ind	arm go off? exposure? clude units)	Yes	No
				If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the ron indication (ind	arm go off? exposure? clude units)	Yes	No
				If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the rron indication (ind	arm go off? exposure? clude units)	Yes	No
				If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the ron indication (ind	arm go off? exposure? clude units)	Yes	No
				If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the ron indication (ind	arm go off? exposure? clude units)	Yes	No
	Comments:			If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al licated during the ron indication (ind	arm go off? exposure? clude units)	Yes	
	Comments:			If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the ron indication (inc	arm go off? exposure? clude units)	Yes	
	Comments:			If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the ron indication (ind	arm go off? exposure? clude units)	Yes	No
	Comments:			If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the ron indication (ind	arm go off? exposure? Clude units)	Yes	No
Per Re	Comments: formed by: viewed by:			If neutrons are indi	[ Were neutrons inc cated, record neut	Did the neutron al dicated during the ron indication (inc	arm go off? exposure? clude units)	Yes	No

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			Tempe	erature									
		N/2 32	Data Sh	oot Sor	tion 7 1								
		1142.52	Data Si										
Manufacturer													
manalaotarer.									-				
Model:			Seria	al Number:									
Requirement:	The instrum	nent shall fu	nction corre	ctly at temp	eratures from	m –20 °C to	+50 °C. If t	he					
	manufactur	er specifies	a broader of	perating ten	nperature rai	nge, the inst	trument sha	Il be tested					
	within the r	ance specifi	iod in Table	pecified by 1	ine manulac	turer. Relati	ve numiaity	snall be					
	within the h	ange specin		1.									
Note:	Comments	are required	d when the re	equirement	is not								
Test Equipment:													
Source Data:													
Source Data:								-					
Ambient (	Conditions:		%RH		in HG								
Instrume	ent Mode of	operation											
						1							
Cs-137			N	Measurem	ent Result	ts							
Gamma Alarm	Threshold:		µR/h	Expo	osure rate o	during test:		µR/h					
	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	1				
1	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4 5 6	_22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4 5 6 7	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4 5 6 6 7 8	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4 5 6 7 7 8	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4 5 6 7 7 8 9 9	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4 5 6 7 7 8 9 10 20 0 10	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4 5 6 6 7 7 8 9 9 10 0 Mean STD	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)				
1 2 3 4 5 6 7 7 8 9 10 0 Mean STD COV	22° C #DIV/0! #DIV/0!	30° C #DIV/0! #DIV/0!	40° C	50° C	10° C #DIV/0! #DIV/0!	0° C #DIV/0! #DIV/0!	-10° C	-20° C	(add units)				
1 2 3 4 5 6 7 7 8 9 9 10 Mean STD COV	22° C	30° C #DIV/01 #DIV/01 #DIV/01	40° C	50° C #DIV/01 #DIV/01 #DIV/01	10° C #DIV/01 #DIV/01 #DIV/01	0° C #DIV/01 #DIV/01	-10° C	-20° C	(add units)	alarmed du	uring the t	sst withou	additional source?
1 2 3 4 5 6 7 7 8 9 10 10 Mean STD COV	22° C #DIV/01 #DIV/01 #DIV/01	30° C #DIV/0! #DIV/0! #DIV/0!	40° C	50° C #DIV/0! #DIV/0!	10° C #DIV/0! #DIV/0! #DIV/0!	0° C #DIV/0! #DIV/0!	-10° C	#DIV/0! #DIV/0!	(add units)	alarmed du	uring the t	st withour	additional source?
1 2 3 4 5 6 7 7 8 9 10 10 Mean STD COV	22° C	30° C #DIV/01 #DIV/01 #DIV/01	40° C	50° C #DIV/0! #DIV/0! #DIV/0!	10° C #DIV/01 #DIV/01 #DIV/01	0° C #DIV/01 #DIV/01 #DIV/01	-10° C	#DIV/01 #DIV/01 #DIV/01	(add units)	alarmed du	uring the t	est withou	t additional source?
1 2 3 4 5 6 7 7 8 9 10 0 Mean STD COV	22° C	30° C	40° C	50° C	10° C #DIV/0! #DIV/0!	0° C #DIV/0! #DIV/0!	-10° C	-20° C	(add units)	alarmed du	uring the t	sst withour	after the test?
1 2 3 4 5 6 7 7 8 9 10 10 Mean STD COV	22° C	30° C #DIV/0! #DIV/0!	40° C	50° C	10° C	0° C #DIV/0! #DIV/0!	-10° C	-20° C	(add units)	alarmed du	uring the t	est withour	t additional source? after the test?
1 2 3 4 5 6 7 7 8 9 9 10 0 Mean STD COV	22° C	30° C #DIV/0! #DIV/0!	40° C	50° C #DIV/0!	10° C #DIV/0! #DIV/0!	0° C #DIV/0! #DIV/0!	-10° C	-20° C	(add units)	alarmed du	ring the t	sst withour	additional source?
1 2 3 4 5 6 7 7 8 9 10 0 Mean STD COV	22° C #DIV/0! #DIV/0!	30° C #DIV/0! #DIV/0! #DIV/0!	40° C	50° C #DIV/0! #DIV/0! #DIV/0!	10° C #DIV/0! #DIV/0!	0° C #DIV/0! #DIV/0!	-10° C	#DIV/0! #DIV/0!	(add units) (add units)	alarmed du	uring the t	est withour	t additional source? after the test?
1 2 3 4 5 6 7 8 9 10 Mean STD COV	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	#DIV/0! #DIV/0!	(add units) (add units)	alarmed du	uring the t	est without	after the test?
1 2 3 4 5 6 7 8 9 10 Mean STD COV	22° C	30° C #DIV/01 #DIV/01 #DIV/01	40° C	50° C	10° C	0° C	-10° C	-20° C	(add units)	alarmed du	uring the t	est without	after the test?
1 2 3 4 5 6 6 7 8 9 10 Mean STD COV	22° C	30° C #DIV/0! #DIV/0! #DIV/0!	40° C	50° C	10° C 10° C #DIV/0! #DIV/0! #DIV/0! #DIV/0! 100 15%	0° C	-10° C	-20° C	(add units)	alarmed du	iring the t	sst without	after the test?

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Cf-252			<u> </u>	Measurem	ent Result	<u>S</u>								
If applicable)														
leutron Alarm T	hreshold:		(add units)			Source	emission o	during test:		n/s				
	22° C	30° C	40° C	50° C	10° C	0° C	-10° C	-20° C						
1									(add units)					
2														
3														
4														
5														
6														
7														
8														
9														
10														
Mean	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
STD	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
COV %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	la eta una e a t		uning the	te et with ev	t a dditional course	
									Vec	alarmed d	uring the	test withou	t additional source	)(
									No					
									Instrument	alarmed w	ith additi	onal source	after the test?	
									Yes					
									No					
		(+ 16	5%) Accorta	neo Pango:	#DIV//01	to	#DIV//01							
		(± 1		ince nange.	#DIV/0	10	#DIV/0	-						
					1010		ingit to to							
Comments:														
									-					
						Date:								
Performed by:														
Performed by:														

TEST AND EVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	<b>PREPARED BY:</b> DIV682			
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								Tem	peratu	re Sho	ck											
							N42	2.32 Da	ta She	et Sec	tion 7.	2										
	Manufacturer:										Test Equi	oment Used:	:									
	Model:			Seri	al Number:																	
													-									
	Requirement:	The instrum	nent shall be	e fully functio	nal within 30	min of expos	ure to rapid te	emperature	changes fro	om 22°C to	–20 °C, –20	) °C to 22 °C,	22 °C to 50	°C, and 50 °	°C to 22 °C	with each of	change					
		being made	e in less tha	an five minute:	s. Relative hi	umidity shall I	be within the	range speci	fied in Table	e 1.												
	0																					
	Source Data:			-					-													
Ambic	nt Conditions		0/DU		in UC			Instrumo	nt Mada of	operation												
AIIDIE	ini conunions.		/41.11		III HG			msuumen	III WOUE OI	operation				-								
	Note:	Comments	are requirer	d when the re	cuirement is	not verified																
	Note.	Commenta	ale lequilet		quirement is	not vernieu.																
0.407								·	Maa		Desculto											
<u>CS-137</u>									wea	surement	tesuits											
Gamma Ala	rm Threshold:		µR/h	Ex	posure rate	during test:		µR/h														
	pre-test at		Te	a la minutes	45	20 to -	20° C	00	45	-20 t	0 20° C	00	45	20 to 5	0°C	00	45	50 to	20° C	00		
	2210	(	III	ne in minutes	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60		
1		(add Units)		1				-														
2				4																		
4				4																		
5				F																		
6				e	5																	
7				7	,																	
8				8	3																	
9				9	9																	
10				10	)																	
Mean	#DIV/0!			Mean	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
STD	#DIV/0!			STD	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
COV %	#DIV/0!			COV %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
																					Instrumen	it alarmed
																					during the	test without
					_																additiona	source?
																					Yes	
																					No	
																					Instrumen	t alarmed
																					after the t	.ional source
																					Voc	531:
		-						ł					<u> </u>							<u> </u>	No	
					<u> </u>					L	L			L	ļ	L	ļ	L	ļ	L	NO	
	4500 4	Den 1	#DU//c:		#Div//e1																	
(±	15%) Acceptar	nce Range:	#DIV/0!	to	#DIV/0!	L																
			IUW (-15%)	)	nign (+15%	)																

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<u>Cf-252</u>									Mea	surement l	Results											
(If applicable)																						
Neutron Ala	arm Threshold	:	(add units)			Sourc	e emission d	uring test:		n/s												
		_				00.1	001.0			00.1	001.0			00.1.5				50.1.	001.0			
	pre-test at		Tim	o in minutos	15	20 to -	-20° C	60	15	-20 ti 30	0 20° C	60	15	20 to 5	J° C 45	60	15	50 to	20°C	60		
1	22.0	(add   Inite)			IJ	JU	40	00	IJ	30	40	00	IJ	30	4J	00	IJ	30	4J	00		
2																						
3																						
4																						
5																						
6		_																				
/																						
0																						
10																						
Mean	#DIV/0!			Mean	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
STD	#DIV/0!			STD	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
COV %	#DIV/0!			COV %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
																					Instrument	t alarmed
																					during the	test without
		-																			additional	source?
																					Yes	
																					NO	
																					Instrument	alarmed
																					after the te	olidi source aet?
																					Yes	-dei
																					No	
		-				-					-	-			-		-					
(±	15%) Accepta	nce Range:	#DIV/0!	to	#DIV/0!																	
			low (-15%)		high (+15%)	)																
	Comments	:																				
	Desferrer 11						B-/															
	renormed by	:					Date:															
	Reviewed by						Date															

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		Humidit	ty				
	N42.32	Data Sheet	t Section 7.3				
Manufacture	r:			_			
Mode	1:		Serial Numb	er:			
Requiremen	it: The instrument shall	function correctly	over the range of relati	ve humidity fror	n 40% to 9	3 % RH at	35 °C.
Not	e: Comments are requi	red when the requi	rement is not verified.				
Test Equipmen	t:						
Source Dat	a:						
A	mbient Conditions:	in H	IG				
Instrumen	Mode of operation						
Gamm	a Alarm Threshold:		(add units)				
Neutro	n Alarm Threshold:		(add units)				

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		Measure	ment Result	<u>s - Cs-137</u>				
Gamma Alarm Threshold		uR/h	E.	xposure rate	during tost	uR/b		
Gannia Alann Threshold.		μιντι		xposure rate	during test.	μιντι		
		Nominal						
			03% PH	40% PH				
		22° C	35° C	35° C				
		22 0	00 0	00 0				
	2				(add units)			
	2				-			
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	Mean	#DIV/0!	#DIV/0!	#DIV/0!				
	STD	#DIV/0!	#DIV/0!	#DIV/0!				
	COV %	#DIV/0!	#DIV/0!	#DIV/0!				
					Instrument ala	armed during th	ne test with	out additional source?
					Yes			
					No			
					Instrument ala	armed with add	itional sour	rce after the test?
					Yes			
					No			
		<u>Ac</u>	ceptance Ra	nge				
		"DI) (/Al		"DI) //AI				
		#DIV/U!	to	#DIV/0!				
		1000 1576		nigit 15%				
					<u> </u>			1

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			Measure	ment Result	s - Cf-252					
(If applicable)										
Neutron Alarr	n Threshold:		(add units)			Source e	mission d	uring test:		n/s
			Nominal							
			40% RH	93% RH	40% RH					
			22° C	35° C	35° C					
		1				(add units)				
		2								
		3								
		4								
		5								
		6								
		7								
		8								
		9								
		10								
		Mean	#DIV/0!	#DIV/0!	#DIV/0!					
		STD	#DIV/0!	#DIV/0!	#DIV/0!					
		COV %	#DIV/0!	#DIV/0!	#DIV/0!					
						Instrumen	t alarmed	during the	e test with	out additional source?
						Yes				
						No				
						Instrumen	t alarmed	with addit	tional sou	rce after the test?
						Yes				
						No				1
			<b>^</b>	contones De						
			AC		nge					
			#DIV/0!	to	#DIV/0!					
			low 15%		high 15%	-				
					Ŭ					
	Comments:									
										-
Pé	erformed by:						Date:			
							2410.			
R	eviewed by:						Date:			
										1



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			Du	st					
		N42.32 E	Data She	et Section	า 7.4.2				
Man	ufacturer:								
	Model:			S	erial Number	:			
Req	uirement:	The instrument cas means that the inst ingress of dust is n satisfactory operati either side of the ve	e design shall rument shall b ot totally preve on of the instru rtical shall hav	meet the require e protected from nted, but dust sl iment or to impa e no harmful effe	ements stated the ingress of hall not penetri ir safety, and ects.	for IP code f dust and s ate in a qua water spray	53 (see IE0 praying wa antity to inte ed at an an	C 60529), w ter. For IP5 erfere with igle up to 60	/hich 3, the 0° on
	Note:	Comments are requ	lired when the	requirement is n	ot verified.				
Test E	quipment:								
Sou	urce Data:								
	Am	bient Conditions:		°C		%RH		in HG	
In	strument M	lode of operation							
	Gamma	Alarm Threshold:			(add units)				
	Neutron	Alarm Threshold:			(add units)				

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		<u>Measure</u>	ment Result	ts - Cs-137			
			n				
		Pre-Test	Post Test				
	1			(add units)			
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	Mean	#DIV/0!	#DIV/0!				
	STD	#DIV/0!	#DIV/0!				
	COV %	#DIV/0!	#DIV/0!				
Instrument ala	rmed with additional						
S	ource after the test?						
	Yes						
	No						
		<u>Ac</u>	ceptance Ra	inge			
		#DIV/01	to	#DIV/01			
		low 15%	10	high 15%			
				ingit to /o			
				· · · ·		Ve	rify
						Yes	No
				Did dust penetr	ate the instrument?		
	,	Instrume	ent alarmed dur	ing the test withou	t additional source?		

NST
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TEST AND EVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	<b>PREPARED BY:</b> DIV682	
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If applicable		Measure	ement Resul	ts - Cf-252		
		Pre-Test	Post Test			
	1			(add units)		
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	Mean	#DIV/0!	#DIV/0!			
	STD	#DIV/0!	#DIV/0!			
	COV %	#DIV/0!	#DIV/0!			
s	ource after the test?					
	Yes					
	No					
	110					
			Acceptance	Range		
			<u></u>	<u>i ten ige</u>		
		#DIV/0!	to	#DIV/0!		
		low 15%		high 15%		
Comments						
Performed by	: 				Date:	
Reviewed by	:				Date:	



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		Moist	ure				
	N42.32 D	ata Shee	et Section	า 7.4.3			
Manufacturer	-						
Manufacturer	•						
Model			S	erial Numbe	r:		
Requirement	The instrument cas means that the inst ingress of dust is n satisfactory operati either side of the ve	e design shall trument shall b ot totally preve on of the instru- ertical shall hav	meet the requir e protected fron nted, but dust s iment or to impa e no harmful eff	ements stated n the ingress c hall not penetr air safety, and ects.	for IP code 53 f dust and spra ate in a quantity water sprayed a	(see IEC 60529), w ying water. For IP5 y to interfere with at an angle up to 60	hich 3, the )° on
Note	Comments are requ	uired when the	requirement is	not verified.			
Test Equipment							
Source Data	:						
Ar	nbient Conditions:		°C		%RH	in HG	
Instrument	Mode of operation						
Gamma	Alarm Threshold:			(add units)			
Neutron	Alarm Threshold:			(add units)			

NIST	TEST AND EVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	PREPARED BY: DIV682	
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		Measurer	<u>nent Result</u>	<u>s - Cs-137</u>				
				]				
		Pre-Test	Post Test					
				<u> </u>				
	1			(add units)				
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	Mean	#DIV/0!	#DIV/0!					
	STD	#DIV/0!	#DIV/0!					
	COV %	#DIV/0!	#DIV/0!					
Instrument alarme	ed with additional							
sourc	ce after the test?							
	Yes							
	No							
		Ac	ceptance Ra	nae				
		#DIV/0!	to	#DIV/0!				
		low 15%		high 15%				
							Va	
						ŀ	Ve	nity No
							103	
			D	id moisture pen	etrate the ir	nstrument?		
			_					ļ
		Instrume	ent alarmed duri	ng the test with	out addition	al source?		
				-				

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If applica	able		Measure	ment Result	s - Cf-252		
			Pre-Test	Post Test			
		1			(add units)		
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9			-		
		10			_		
		Mean	#DIV/0!	#DIV/0!			
		STD	#DIV/0!	#DIV/0!			
		COV %	#DIV/0!	#DIV/0!			
In	strument alar	med with additional					
	SC	ource after the test?					
		Yes					
		No					
				Acceptance	Range		
			#DIV/0!	to	#DIV/0!		
			IOW 15%		nign 15%	 	
	Comments:						
<b>P</b> -	ufauma al h					Date	
Pe	rtormed by:					Date:	
R	eviewed by:					Date	
	Jiionea by.					Duit.	



		Cold Te	mperatu	re Start U	р			
		N42.32 Da	ta Shee	t Section	7.5			
Manufacturer:								
Model:				Serial Number:				
Requirement:	The inst	rument shall be able	e to operate wh	nen switched on	at the cold terr	perature lin	nit (-20 °C)	
Note:	Commer	nts are required whe	n the requirem	ent is not verifie	d.			
Test Equipment:								
Source Data:								
Ambient Cor	nditions:		%RH		in HG			
Instr	rument N	Node of operation						
	Gamma	Alarm Threshold:			(add units)			
	Neutron	Alarm Threshold:			(add units)			

NST
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		Measure	ment Result	<u>s - Cs-137</u>				
Gamma Alarm Threshold		(add units)	F	xposure rate d	lurina test:		uR/h	
		(add anico)					p	
		Pre-Test Readings at 20 C	Readings at -20 C					
	1			(add units)				
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	Mean	#DIV/0!	#DIV/0! #DIV/01					
	COV %	#DIV/01	#DIV/0!					
	007/0	#01070!	#01070!	Instrument a	larmed durir	na the tes	twithout	additional source?
				Yes		9		
				No				
				Instrument a	larmed with	additiona	al source a	after the test?
				Yes				
				No	1 1			
		<b>A</b> -						
		<u>Ac</u>	ceptance Ra	nge				
		#DIV/0!	to	#DIV/0!				
		low 15%		high 15%				
				<u> </u>				

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lf Annling bla		Magazira	mant Decult	Cf 252				
If Applicable		measure	ment Result	<u>is - CI-252</u>				
		Dro Toot						
		Pie-iesi Readings at	Readings at					
		20 C	-20 C					
	1			(add units)				
	2			(add anico)				
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	Mean	#DIV/0!	#DIV/0!					
	STD	#DIV/0!	#DIV/0!					
	COV %	#DIV/0!	#DIV/0!					
				Instrument al	armed du	ring the te	stwithout	additional source?
				Yes				
				NO Instrument al	armed wit	h addition	al source	after the test?
				Yes				
				No				
		Ac	ceptance Ra	nge				
		#DIV/0!	to	#DIV/0!				
		IOW 15%		nign 15%				
Comments:								
Performed by:					Date:			
Reviewed by:					Date:			



	Ele	ctrostat	tic Disch	arge				
	N42.32	Data S	Sheet Sec	ction 8.1				
Manufacturer:								
Model:			Se	erial Number:				
Requirement:	The instru using the	ment shall contact dis	not be affecte charge techni	d by exposure que.	to electrostati	c discharges at i	ntensities of	up to 6 kV
Note:	Comment	s are requir	ed when the r	equirement is	not verified.			
Ambient Conditions:		°C		% RH		in Hg		
Test Equipment Used:								
Source Data:								
Instrument Mode of	operation							
Gamma Alarm T	hreshold:			(add units)				
Neutron Alarm T	hreshold:			(add units)				



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<u>Cs-137</u>								
	Pre-test readings			After 2kV discharge readings	After 4kV discharge readings	After 6kV discharge readings	post-test readings	
1			1					(add units)
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
10			10					
Mean	#DIV/0!		Mean	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
STD	#DIV/0!		STD	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
COV %	#DIV/0!		COV %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	<u>]</u>
	Acceptance range:							
	low (-15%)	#DIV/0!						
	high (+15%)	#DIV/0!						
						Yes	No	
Did the	instrument alarm as	a result of	the elect	ostatic disch	narge alone?			

NIST
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Η	TEST AND EVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	PREPAR DIV682	ED BY:
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Cf-252	(If applicable)							
	,							
				After 2kV	After 4kV	After 6kV		
	Pre-test readings			discharge	discharge	discharge	post-test	
				readings	readings	readings	readings	
1			1					(add units)
2			2					
3			3					_
4			4					
5			5					
6			6					
/ Q			/ 8					
0			0 Q					
10			10					
Mean	#DIV/01		Mean	#DIV/01	#DIV/01	#DIV/0I	#DIV/0I	
STD	#DIV/0!		STD	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
COV %	#DIV/0!		COV %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
								4
	Acceptance range:							
	low (-15%)	#DIV/0!						
	high (+15%)	#DIV/0!						
	Ŭ ( ,							
	Comments:							
	Performed by:				Date:			_
	<u> </u>							
	Reviewed by:				Date:			



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		Ra	adio Fr	equency	Field				
		N42.32	2 Data	Sheet Se	ction 8.2				
Manufacturer									
Model						Serial Number:			
Requirement	The instrument shall not intensity of 50 volts per i	be affected by radio f meter (V/m). When ex	requency (F posed to th	RF) fields over ti nese RF fields,	ne frequency range he instrument sha	of 80 MHz to 2. Il function correc	5 GHz at an tly. No alarms		
	shall occur as a result o	f the RF radiation alor	ne.						
Note	Comments are required	when the requirement	is not verifi	ed.					
Ambient Conditions	•		°C			% RH		in Hg	
<b>T</b> ( <b>T</b> ) ( <b>1</b> )									
lest Equipment Used									
Source Data									
Instrum	ent Mode of operation								
Ga	mma Alarm Threshold:								
Net	utron Alarm Threshold:								

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					Test	vithout a Ra	diation Sour	rce			1
	Pre-test	readings			1001	in anour a ra					
		J. J									
	Nominal N	No Intensity									
	Gamma (add units)	Neutron (add units)									
1	· · · ·	· · ·	(add appropriate units)	1				Accepta	ance Range	(Gamma)	
2								#DIV/0!	to	#DIV/0!	
3								low (-15%)		high (+15%)	
4											
5											
6								Accepta	ance Range	(Neutron)	
7								#DIV/0!	to	#DIV/0!	
8								low (-15%)		high (+15%)	
9											
10											
Mean	#DIV/0!	#DIV/0!									
STD	#DIV/0!	#DIV/0!									
COV %	#DIV/0!	#DIV/0!									
	If anomalies or alarn	ns are observed list th	em in the table below	/							
		Teater	iller a De d'ation Oa								
		lest w	ithout a Radiation So	ource							
		Frequenc	y Scan Test 80 MHz to	2.5 GHZ		Alere	- Ture				
	Frequency (MHz)	Commo	Noutrop	Ala	aiiii No	Alali	Noutron				
		Gamma	Neutron	Tes	INU	Gaillilla	INEULION				
										_	
					1						
					1						
					Î	1					
						Yes	No				
		Did the instrum	nent alarm as a result	of the R	Falone?						

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					Test with a Rad	liation Sourc	e			
	Pre-test	readings								
	Nominal N	lo Intensity								
	Gamma (add units)	Neutron (add units)								
1			(add appropriate units)	)			Accep	otance Range (G	amma)	
2							#DIV/0!	to	#DIV/0!	
3							low (-15%)		high (+15%)	
4										
5										
6							Accep	tance Range (N	leutron)	
7							#DIV/0!	to	#DIV/0!	
8							low (-15%)		high (+15%)	
9										
10										
Mean	#DIV/0!	#DIV/0!								
STD	#DIV/0!	#DIV/0!								
COV %	#DIV/0!	#DIV/0!								
	If anomalies are obs	erved list them in the	table below							
	In anomaneo are obo					1				
	Tog	t with a Padiation So	Irco							
	Frequence	with a Radiation Sol								
	Frequenc		0 2.3 GHZ							
	Frequency (MHz)	Rea	aing							
		Gamma	Neutron							
	Comments:									
									i	
						-			i	İ
										1
	Dorformed buy						Deter			
	Fenomed by:						Date:			
	Poviowod bu						Deter			
	Reviewed by:						Date:			

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		Magne	tic Field					
	N42.32	Data Sh	neet Sect	ion 8.3				
Manufactur	er:							
Mod	lel:		Se	rial Number:				
Requireme	nt: When expose to a 10 gauss	ed to direct cu s (1 mT) magr	urrent (DC) mag netic field, the ir	netic fields in Instrument sha	all three mutu Il function cor	ually orthogona rectly.	l orientations r	elative
No	te: Comments a	re required wh	nen the requiren	nent is not veri	fied.			
Anglein at Oran ditio		° <b>0</b>		0/ DU		in the		
Ambient Conditio	ns:	C		% RH		in Hg		
Test Equipment Us	ed:							
Source Da	ta:							
Instrument Mo	de of operation							
Gamma A	arm Threshold:			(add units)				
Neutron A	arm Threshold:			(add units)				

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				Measureme	nt Results				
With Cs-137									
	Initial Orie	entation	1	Second Or	rientation	-	Third Orie	entation	1
	Nominal	10 Gauss		Nominal	10 Gauss		Nominal	10 Gauss	
	Zero Intensity	(DC)		Zero Intensity	(DC)		Zero Intensity	(DC)	
1									(add units)
2									
3									
4									
5									
6									
1									-
8									
9									
10									
Mean	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	
STD	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	
COV %	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	
				Acc	ceptance Ra	nge			
		Initia	l Orientation.	#DIV//01	40	#DIV//01			
		Initia	al Orientation:	#DIV/0!	to	#DIV/0!			
				10W - 15%		nign + 15%			
		Secon	d Orientation:	#DIV/01	to	#DIV/01			
		36001		#DIV/0!	10	#DIV/0!			
				100 - 13 /0		night 1376			
		Thir	d Orientation:	#DIV/01	to	#DIV/01			
				low -15%		high +15%			
				Measureme	nt Results				
With Cf-252									
	Initial Orie	entation		Second Or	rientation		Third Orie	entation	
	Nominal	10 Gauss		Nominal	10 Gauss		Nominal	10 Gauss	
	Zero Intensity	(DC)		Zero Intensity	(DC)		Zero Intensity	(DC)	
1									(add units)
2									
3									
4									
5									
6									
7									
8									
9									
10									
Mean	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	
STD	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	
COV %	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	
				<u>Acc</u>	ceptance Ra	nge_			
		Initia	al Orientation:	#DIV/0!	to	#DIV/0!			
				IOW -15%		nign +15%			
		C	d Orientetier	#DIV//01	to	#DIV//01			
		Secon	u Unentation:	#DIV/U!	ιΟ	#DIV/U!			
				10w - 15%		111911 + 15%			
		Thir	d Orientation:	#DIV/01	to	#DIV/0			
		1111		#019/01	iU				
				low_15%		$n_{100} + 15\%$			
				low -15%		nign +15%			
				low -15%		nign +15%			



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				weasurenne	In no suns				
				Without S	Sources				
nma resp	oonse			maioure					
	Initial Orie	entation		Second O	rientation		Third Orie	entation	_
	Nominal Zero Intensity	10 Gauss		Nominal Zero Intensity	10 Gauss		Nominal	10 Gauss	
1	Zero Intensity	(DC)		Zero intensity	(DC)		Zero Intensity	(DC)	(add uni
2									(add ann
3									
4									
5 6	-								
7									
8									
9									
10									
Mean	#DIV/0!	#DIV/0! #DIV/01		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	-
COV %	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	-
				<u>Ac</u>	ceptance Rai	nge			
		Initia	al Orientation:	#DIV/0!	to	#DIV/0!			
				low -15%		high +15%			
		-							
		Secon	d Orientation:	#DIV/0!	to	#DIV/0!			
				10w - 15 /6		11g11 + 15 //			
		Thir	d Orientation:	#DIV/0!	to	#DIV/0!			
				low -15%		high +15%			
							1 1		
	Did the instrur	ment alarm a	is a result of	the magnetic	filed alone?	Yes	No		
	Did the instrur	nent alarm a	is a result of	the magnetic Init	filed alone?	Yes	No		
	Did the instrur	nent alarm a	is a result of	the magnetic Init Seco	filed alone? ial orientation nd orientation	Yes	No		
	Did the instrur	ment alarm a	as a result of	the magnetic Init Seco Th	filed alone? ial orientation nd orientation ird orientation	Yes	No		
	Did the instrur	nent alarm a	is a result of	the magnetic Init Seco Th	filed alone? ial orientation nd orientation ird orientation	Yes	No		
	Did the instrur	nent alarm a	is a result of	the magnetic Init Seco Th Without \$	filed alone? ial orientation nd orientation ird orientation	Yes	No		
tron res	Did the instrum	nent alarm a	is a result of	the magnetic Init Seco Th Without S	filed alone? ial orientation nd orientation ird orientation Gources	Yes	No		
tron res	Did the instrum	nent alarm a	e)	the magnetic Init Seco Th Without S	filed alone? ial orientation nd orientation ird orientation Sources	Yes			
tron resp	Did the instrum	nent alarm a (if applicable entation	s a result of	the magnetic Init Seco Th Without S Second O	filed alone? ial orientation nd orientation ird orientation Gources	Yes	No Third Orie	entation	
tron resp	Did the instrum	nent alarm a (if applicable entation 10 Gauss (DC)	s a result of	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation nd orientation ird orientation Sources rientation 10 Gauss (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	
tron resp	Did the instrum	(if applicable entation 10 Gauss (DC)	s a result of	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation nd orientation ird orientation Sources rientation 10 Gauss (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	(add unit
tron resp 1	Did the instrum	(if applicable entation 10 Gauss (DC)	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation nd orientation ird orientation Sources rientation 10 Gauss (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	(add unit
tron resp 1 2 3	Did the instrum	(if applicable entation 10 Gauss (DC)	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation nd orientation ird orientation Sources rientation 10 Gauss (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	(add unit
tron resp 1 2 3 4	Did the instrur	(if applicable entation 10 Gauss (DC)	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation ind orientation ird orientation Sources irientation 10 Gauss (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	(add unit
tron resp 1 2 3 4 5 6	Did the instrur	(if applicable entation 10 Gauss (DC)	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	(add unit
tron resp 1 2 3 4 5 6 7	Did the instrur	(if applicable entation 10 Gauss (DC)	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	add unit
tron resp 1 2 3 4 5 6 7 8	Did the instrum	(if applicable entation 10 Gauss (DC)	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	add unit
tron resp 1 2 3 4 5 6 7 8 9 9	Did the instrum	(if applicable entation 10 Gauss (DC)	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	rientation filed alone? filed a	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	add unit
tron resp 1 2 3 4 4 5 6 7 8 9 9 100	Did the instrum	(if applicable entation 10 Gauss (DC)	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC) 	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC)	add unit
tron resp 1 2 3 4 5 6 7 8 9 10 Mean STD	Did the instrum	(if applicable entation 10 Gauss (DC) 	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity #DIV/0! #DIV/0!	filed alone? ial orientation ind orientation ird orientation Sources fientation 10 Gauss (DC) #DIV/0! #DIV/0!	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC) #DIV/0!	add unit
tron resp 1 2 3 4 5 6 7 8 9 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) (DC) #DIV/01 #DIV/01 #DIV/01	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity HDIV/0! #DIV/0! #DIV/0!	filed alone? ial orientation ind orientation ird orientation Sources fientation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	Yes	No Third Orice Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0!	add unit
tron rest 1 2 3 4 4 5 6 6 7 7 8 9 10 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity Mithout S Second O Second O Nominal Zero Intensity Mithout S Second O Nominal Zero Intensity Mithout S Second O Nominal Zero Intensity Mithout S Second O Nominal Zero Intensity Mithout S Second O Second	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	Yes	No Third Orie Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	(add unit
tron resp 1 2 3 4 5 6 6 7 8 9 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0! ceptance Rat	Yes	No Third Orie Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	(add unit
tron resp 1 2 3 4 5 6 6 7 8 9 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	e)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC) 40 (DC) 40 (DC)	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	(add unit
tron resp 1 2 3 4 5 6 6 7 8 9 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0!	a)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0! to	Yes	No Third Orie Nominal Zero Intensity	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	add unit
tron resp 1 2 3 4 5 6 7 8 9 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0!	a)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0! to	Yes	No Third Orie Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	add uni
tron resp 1 2 3 4 5 6 7 8 9 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0!	a)	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0! #DIV/0! Iow -15% #DIV/0!	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0! to to	Yes 	No Third Orie Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	(add unit
tron resp 1 2 3 4 5 6 7 7 8 9 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!	al Orientation:	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0! #DIV/0! Iow -15% #DIV/0! Iow -15%	filed alone? ial orientation ind orientation ird orientation Sources rientation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0! to to	Yes	No Third Orie Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	a constraints of the second se
tron resp 1 2 3 4 5 6 7 7 8 9 10 Mean STD COV %	Did the instrum	(if applicable entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!	al Orientation: d Orientation:	the magnetic Init Seco Th Without S Second O Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0! #DIV/0! Iow -15% #DIV/0!	filed alone? ial orientation ind orientation ird orientation <b>Sources</b> rientation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! to to to	Yes	No Third Orie Nominal Zero Intensity #DIV/0! #DIV/0! #DIV/0!	entation 10 Gauss (DC) #DIV/0! #DIV/0! #DIV/0!	a contraction of the second se

NIST	
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Comments:				
Performed by:		Date:		
Reviewed by:		Date:		



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Radiated Emissions									
	N42.32 Data Sheet Section 8.4								
	Manufacturer:								
	Model:			Ser	ial Number:		- ·		
	Requirement:	RF emission	is from an ins	trument shall be	less than tha	at which can int	terfere with		
		other equipm	nent located i	n the area of use	e. RF emissio	ns when meas	ured at three		
		meters shall	be less than	: 		01			
			Emission	ande	Field	Strength			
			//	MU-)	(micro y	olte/motor)			
			(I 20			100			
			88	_ 216		150			
			216	- 210 S - 960		200			
			Abo	ve 960		500			
			,						
	Note:	Comments a	are required w	hen the requiren	nent is not ver	rified.			
۸mhio	nt Conditions:		°۲		% DH		in HG		
AIIIDIE	ni conunions.		C		701511				
Test Eau	upment Used:								
							-		
Instr	rument Mode o	of operation							
		Requi	rement		Yes	No			
		Where PE		have the limits?					
	Provide instrum	ent emission	n plot if availal	ole					
	Comments:								
I	Performed bv:				Date:				
					24.01				
	Reviewed by:				Date:				



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		N	/ibration				
	N42	2.32 Data	a Sheet S	Section	9.1		
Manufacturer:							
Model:			Seri	al Number:			
Requirement	The instrument	shall withsta	ind exposure	to vibrations	associated	with the open	ation of handh
	hand carried eq	uipment. The	e physical co	ndition and fu	unctionality of	of the instrum	ent shall not
	affected by exp	osure (e.g., s	solder joints s	shall hold, nu	its and bolts	shall not cor	ne loose).
Note:	Comments are	required whe	en the require	ment is not v	erified.		
Ambie	ent Conditions:		°C		%RH		in HG
Test Eq	uipment Used:						
	Source Data:						
Gamma Ala	arm Threshold:			(add units)			
Neutron Ala	arm Threshold:			(add units)			
	Insti	rument Re	ading - Cs-	137			
		After	After	After			
	Before Vib	Position A	Position B	Position C			
Exposure Rate							
1					(add units)		
3							
4							
5							
7							
8							
10							
Mean	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1		
STD	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
COV %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	I		
	Acc	eptance Ra	nge				
	#DIV/01	to	#DIV/01				
	low (-15%)	10	high (+15%)				
Did the un	it alarm when	exposed to	a source aff	er the test?	Position A	Position R	Position C
		onposed to	a source all	Yes		. conton D	
	i	1	i	No			
Did the unit alar	m due to vibra	tion alone?	Position A	Position B	Position C		
		Yes					
	1	NO					



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	Inst	trument Re	ading - Cf-	252				
If applicable								
		After	After	After				
	Before Vib	Position A	Position B	Position C				
Count Ra	ite				<i>.</i>			
	1				(add units)			
	2							
	3							
	5							
	6							
	7							
	8							
	9	1	1					
	10							
Me	an #DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!				
S <sup>.</sup>	<b>TD</b> #DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!				
COV	% #DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!				
	Ace	ceptance Ra	nge					
	#DIV/0!	to	#DIV/0!					
	low (-15%)		high (+15%)					
					<b>D</b> ''' A			
Did the	unit alarm when	exposed to	a source aft	er the test?	Position A	Position B	Position C	
				Yes				
		1		No				
Commen	ts:							
Performed h	ov:				Date			
					2410.			
Reviewed k	by:				Date:			
	-							



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		Dro	p Test					
Manufacturer:								
Model:	-			Serial Number:	-			
Requirement:	After being subje instrument shall	cted to drops of function correc	on each of its s tly and alarm a	ix surfaces from a t a change in the	a height of 1.5 m radiation field.	onto a concret	e floor, the	
Noto	Commonte aro r	quired when th	o roquiromont	is not varified				
Note:				is not vernieu.		1		
Instrument Mo	de of operation							
Source Data:					Test Eq	uipment Used:		
A		Dec			0/ DU		in Lla	
Ambient Conditions:		Deg C			% RH		in Hg	
Gamma A	larm Threshold:				(add units)			
					. ,			
Neutron A	larm Threshold:				(add units)			
		Alarr	n Indication	Posults (add i	unite)			
		Alan			<u>ants)</u>			
					If appl	icable		
	Cs-1	37			Cf-	252		
	Pre-test	Post-test			Pre-test	Post-test		
Readings	Photons	Photons		Readings	Neutrons	Neutrons		
1			(add units)	1			(add units)	
3				3				
4				4				
5				5				
6				6				
7				7				
8 م				8				
10				10				
Mean	#DIV/0!	#DIV/0!			#DIV/0!	#DIV/0!		
STD	#DIV/0!	#DIV/0!	1		#DIV/0!	#DIV/0!		
COV %	#DIV/0!	#DIV/0!			#DIV/0!	#DIV/0!		
Δ	Accentance Range				Δι	ceptance Ran	de	
<u>^</u>		<u>-</u>			<u> </u>		<u>3~</u>	
#DIV/0!	to	#DIV/0!			#DIV/0!	to	#DIV/0!	
low (-15%)		high (+15%)			low (-15%)		high (+15%)	

|--|

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						-	
	A lo um	Desition 1	oid the instrum	ent alarmed o	lue to the drop?	Position 5	Desition 6
	Alarm	POSILION	POSILION 2	POSITION 2	POSITION 4	POSILION 5	POSILIONO
	Yes						
	No						
	Did the	instrument pro	duced a gamr	na alarm whe	n exposed to a	source after th	e drop?
	Alarm	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
	Yes						
	No						
		D	id the instrum	ent controls fu	nction properly	?	
	Controls	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
	Yes						
	No						
		Did	the instrumen	t show visible	external dama	ge?	-
	Damage	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
	Yes						
	No						
oplicable	e						
	Did the i	instrument pro	duced a neutr	on alarm whe	n exposed to a	source after th	e drop?
	Alarm	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
	Yes						
	No						
	Comments:						
	Commenta.						
P	erformed by:				Date:		
	Poviowod by:				Data		
	REVIEWED DV.				Date:		



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	Impact Test						
	N42.32	2 Data Sh	neet Section	on 9.3			
Manufacturer:							
Model:			Serial Number:				1
	<b></b>						
Requirement:	from low intensity the instrument's	response snai y impacts from response shall	sharp contact w be tested with th	y microphonic co ith hard surfaces ne <sup>252</sup> Cf source.	If the instrume	ent has a neutron	detector,
Note:	Comments are re	equired when th	ne requirement is	not verified.			
Instrument Mo	de of operation						
Source Data:				Test Equ	uipment Used:		
Ambient Conditions:		Deg C		% RH		in Hg	
Gamma A	Gamma Alarm Threshold:			(add units)			
Neutron A	Neutron Alarm Threshold:			(add units)			
					lf app	licable	
	Cs-137				Cf-252		
	Pre-test	Post-test			Pre-test	Post-test	
1			(add units)	1			(add units)
3				3			
5				5			
6				6			
8				8			
9 10				9 10			
Mean	#DIV/0!	#DIV/0!		Mean	#DIV/0!	#DIV/0!	
COV %	#DIV/0!	#DIV/0!		COV %	#DIV/0!	#DIV/0!	
Acceptance Range	#DIV/0!	to	#DIV/0!		#DIV/0!	to	#DIV/0!
3	low (-15%)		high (+15%)		low (-15%)		high (+15%)
NIST	TEST AND EVALUATION PROTOCOL	<b>TEP NO.</b> N42.32	<b>PREPARED BY:</b> DIV682				
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		Did the instrum	ent alarm duri	ing Impact with	nout any source p	oresent?	
		Impact front	Left side	Impact back	Right side	Тор	Bottom
First Impact	Yes	· ·		•		· · ·	
	No						
		lun une et fine unt		luuu a at ka ak	Disché airda	Tam	Dettem
Second Impact	Vas	impact front	Leit side	ппраст раск	Right side	төр	Bottom
	No						
		Impact front	Left side	Impact back	Right side	Тор	Bottom
Third Impact	Yes						
	No						
		Did the instrum	ent alarm duri	ing the post-tes	t with the source	present?	
				ing the post tes		presenti	
Gammas:	Yes				Neutrons:	Yes	
	No				(if applicable)	No	
Comments:							
Performed by:			Data				
Feriorined by.			Date.				
Reviewed by:			Date:				
Reviewed by:			Date:				

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