



DoD Nuclear Survivability Program

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History of DoD Nuclear Survivability

- DoD nuclear survivability is firmly rooted in the Cold War
 - Strategy was to defeat a peer adversary
 - To counter the Soviet threat, DoD maintained very strict survivability standards ensured with rigorous testing and maintenance
- Collapse of Soviet Union significantly altered role/need for nuclear survivability
 - With no perceived threat, there was little incentive to harden systems; but plenty of savings





History of DoD Nuclear Survivability (cont)

- **The relaxing of DoD survivability standards: 1991-1996**
 - DoDD 4254 “Acquisition of Nuclear Survivable Systems” mandated that:
“DoD components shall ensure that the nuclear survivability of non-major systems is evaluated for possible operational impacts on critical functions supporting vital missions.”
 - Directive also spelled out responsibilities for oversight and management of nuclear survivability
 - Each DoD Component developing or procuring a system was responsible for verifying nuclear survivability/hardness and to develop hardness maintenance/sustainability over each system’s lifetime
 - In 1991, the DoD 5000 series was first published to address the post-Cold War environment
 - Nuclear survivability was now to be addressed in a “cost-effective manner”
 - Specific responsibilities for nuclear survivability oversight and management were no longer identified



History of DoD Nuclear Survivability (cont)

- **The rise of COTS: 1996-2002**
 - All references to nuclear survivability were deleted in the 1996 5000-series revision
 - *“Unless waived by the Milestone Decision Authority, mission critical systems shall be survivable to the threat levels anticipated in their operational environment.”*
 - With survivability no longer emphasized, U.S.-Russian détente and the push for rapid acquisition through COTS, survivability was quickly dumped by program managers, the Services, etc.
 - The 2000 revisions did not address how to acquire nuclear survivable systems nor did they assign OSD responsibility for oversight





History of DoD Nuclear Survivability (cont)

■ Alarm bells: EMP Commission 2001

- By 2000, nuclear survivability became a casualty of cost-cutting, COTS usage, and the “Cold War” perception
 - This was aggravated by the “capabilities” based, spiral development acquisition strategy
- Congressional hearings and inquiries on the matter were met with unsatisfactory responses by DoD
- 2001 Defense Authorization Bill established an EMP Commission to assess the EMP threat to the United States, U.S. ability to recover, and recommend protection steps
 - Two iterations of Commission: final report released in 2009
- Efforts of Commission shed light onto overall nuclear survivability decline within DoD and the vulnerability of our national infrastructure (lead issues for DHS, DOE, White House)





DoDI 3150.09 *CBRN Survivability Policy*

- My position created within NCB/Nuclear Matters office in 2006
 - Key goals to accomplish:
 - Re-introduce nuclear survivability as a key parameter into DoD Directives, Instructions, and Manuals
 - Assign responsibilities for CBRN Survivability
 - Re-establish acquisition processes for nuclear survivability; especially CBRN mission critical systems
 - Require annual survivability reports from the Services and MDA
 - Establish the CBRN Survivability Oversight Group Nuclear (CSOG-N) to oversee DoD CBRN survivability policy
 - DoDI 3150.09 was approved in 2008 to accomplish the above tasks



DoDI 3150.09's Scope

DoDI 3150.09

DoDI 3150.3 (1994)

Nuclear C3 & Nuclear Delivery Systems (must be survivable)

well beyond NUC threats

CBR

PERSONNEL

Major Combat Systems

Ships, Aircraft, Family of Combat Vehicles, Missiles, etc.

Other Systems & Equipment

CBR

Personnel Protection, C3, Conventional Comm Ctrs, Major HQs, MHE

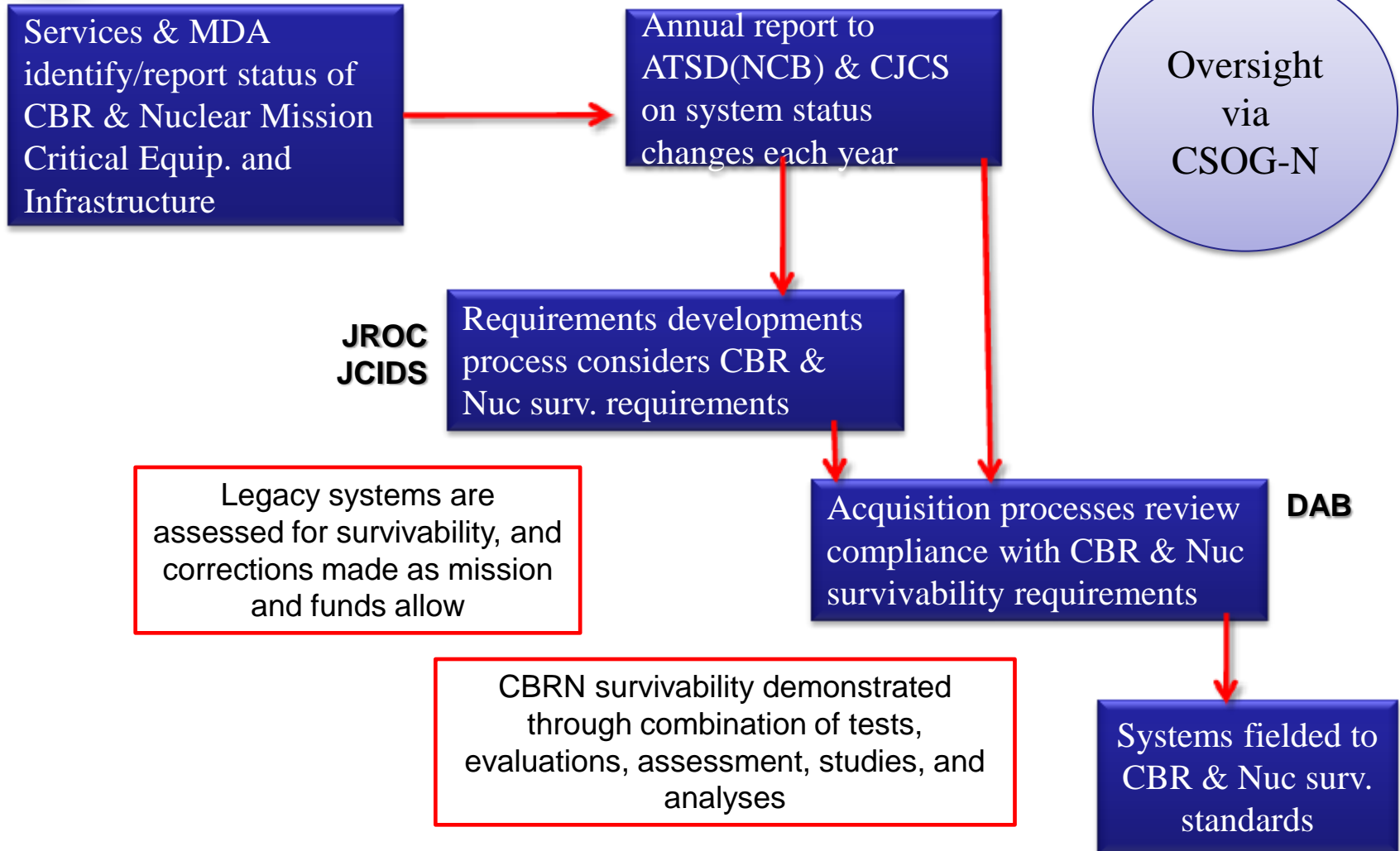
Supporting Infrastructure

Ports, Airfields, Bases, transportation nodes, electric power assets, ...

MISSION CRITICAL EQUIPMENT



Mission-Critical Equipment Process





Illustrative Mission Critical Report Overview

ORG	Total CBRN MSN Critical	Legacy & New Systems	Total Nuc & EMP	Nuclear Hard Requirement	EMP Survivability Requirement	HM/HS Program
Army	127	72/55	104	69	98	13
Navy	173	160/13	171	10	173	10
Air Force	199	191/8	47	40	47	24
MDA	67	62/5	65	14	20	24
Total	566	485/81	387	133	338	71



Annual Mission Critical Report (format revised for 2010)

Mission Critical Environment		Acquisition Management Info														OPTIONAL	Survivability Status & Funding to Identify and Mitigate Vulnerabilities																				
Report Item #	Mission Critical System Name (regardless of threat environment)	"CBRN Mission Critical"	Chemical	Biological	Radiological	Nuclear	EMP	ACAT	Last Milestone / Program Review	Material Sol'n	Analysis Technology	Development & Engineering	Manufacturing Production and	Deployment Operations & Support	Rad Hard	Microelectronics	HPM/RF Energy Mitigation?	Compliance Funding		Compliance Funding		Compliance Funding		Compliance Funding		Compliance Funding		Compliance Funding		Compliance Funding		Compliance Funding		Compliance Funding		Compliance Funding	
																		q1	q2	r1	r2	s1	s2	t1	t2	u1	u2	v1	v2	w1	w2	x1	x2	y1	y2	z1	z2
1	Widget #1	Y	N	N	N	N	N	II	O2/O7	N	Y	Y	Y	N	N	N	N	P	P	NA	NA	P	N	P	N	NC	?	NC	N	P	Y	NC	N	NC	Y	NC	Y
a	Documented Survivability Requirements of Program		(Priority)													What is the survivability requirement (in ROC, ICD, CDD, CPD, RDD, JUON, JROC Interest, KSA, KPP) and CONOPs environment? (OPTIONAL: Identify priority or tier-level, as appropriate, used by Service or MDA management.)																					
b	Information on Last Milestone / Program Review (column I)		Milestone / Program Review and applicable documentation (e.g., ADM, TDS, AS, Pgm Baseline, TEMP, ...)																																		
c	Plan for achieving CBRN survivability		Text indicating the approach to achieving system survivability (e.g., through hardening, timely resupply, redundancy, mitigation techniques, or a combination)																																		
d	How compliance is determined		Explanatory text on how survivability status is validated (e.g., last test or evaluation, plans for next test, ...)																																		
e	Follow-on system (planned or under consideration)		Enter "Report Item #" for cross reference, and vice versa.																																		
f	At least for Nuclear Weapon Delivery Systems and Nuclear Command and Control Systems: What critical mission-support equipment is related to this item?		"None." Or report here or as a separate item any (1) sets, kits, & outfits; (2) material handling equipment; (3) electronic or other keying or enabling devices; (4) etc. that are essential for mission accomplishment and their CBRN survivability status, as appropriate.																																		
g	COCOM support for, or requirements for, this item to be CBR, or Nuclear, or EMP survivable.		Which COCOMs have submitted requirements or expressions of need (JUONS/ONS/UNS, IPLs, CDD, etc.) apply to this item's CBRN suvivability?																																		
h	Issues or concerns to note		Explanatory text on matters the Department or Agency wishes to highlight (e.g., inadequate test facilities or infrastructure, ...)																																		



Successes and Drivers since 3150.09 (2008)

■ CSOG-N Principals

- Flag-level oversight of processes

■ Testing of aircraft (E-4B & B-2)

- **Aug 2010**: Verified E-4B survivability to MIL-STD 2169B
- Used MIL-STD 3023 (DRAFT) as test approach & protocol
- E-4B Aircraft passed with flying colors
- **Mar-Apr 2011**: B-2 bomber just completed initial testing: test results due soon.



■ Congressional interest

- Testimony of senior leadership on HEMP
- House EMP Caucus: Focus on infrastructure (EMP on electrical grid)
- DoD reports on EMP -- 2009, 2011, 2013, 2015
- GAO investigating CBRN survivability program & process



2011 Actions under the CSOG-N

■ **3150.09 Revision**

- Our office, in conjunction with NCB/CBD, is beginning a revision of the current DoDI
- Items addressed in the revised instruction:
 - COCOM input/assessments of the MCRs
 - Specific language to generate renewed interest in nuclear effects within wargames & simulations

■ **S&T Roadmap for Mission Assurance**

- Infrastructure
- DCIP

■ **Resurrecting nuclear survivability standards (next slide)**



Focus Example: Resurrecting Standards

- **MIL-STDs were largely weakened or ignored**
 - Many nuclear survivability standards now provide only general guidance:
 - *“Compliance shall be verified by system, subsystem, and equipment-level tests, analyses, or a combination thereof.”*
 - In 2007, USSTRATCOM requested DTRA develop an upgraded and extended HEMP survivability standard
 - Goal was to provide quantifiable mission assurance
 - MIL-STD 3023 “HEMP Protection for Military Aircraft” provides a set core of requirements/metrics for hardening and testing aircraft to a fixed design margin
 - Contention on fixed vs. tailorable design margins

- Other standards on the way: maritime and space





“Technology Strategy for Mission Assurance in Electromagnetic Pulse Environments”

- ODDRE (now ASD(R&E)) asked NM to lead the development of an ‘S&T Roadmap for EMP Hardening’.
- Vision: Provide a mean for promulgating technology solutions across the DoD and the Interagency to enable a more coherent and focused portfolio of EMP mission assurance programs.
- What: Strategic-level document that:
 - provides overall guidance to the Office of the Secretary of Defense (OSD), the Services, Combatant Commands and technology managers throughout the DoD
 - will inform the Department of Energy, Department of Homeland Security and the Office of Science and Technology Policy.
 - will inform decision makers about the vulnerability of our systems and provide strategies for reducing those vulnerabilities
 - identifies areas of current and future science and technology that address EMP survivability needs for the next 15 years.
- Goal: Publish by 1 August 2011 -- *Still time for your ideas!*



Points of Contact on Nuclear Survivability in ODASD(Nuclear Matters)

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Questions?

