2010 DoD Strategic Plan For T&E Resources Nuclear Weapons Effects (NWE) Focus Area

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Overview

• TRMC Establishment
• Strategic Plan Law and Guidance
• Inputs to and Outputs of the Strategic Plan
• Strategic Plan Systems Engineering Approach
• Domain and Focus Area Working Groups
• 2010 Strategic Plan & CBRN T&E Standards
• 2010 Strategic Plan & The NWE “Focus Area”
  – Strategic Plan & Strategic Planning Process
  – NWE Infrastructure Per The 2010 Strategic Plan
• Where We Are Today In The CSOG-N Process – TRMC Perspective
TRMC Establishment

- The 2003 NDAA, directed the SecDef to establish a DoD-level resource management organization
- DoD Directive (DoDD) 5105.71 established the TRMC as a DoD Field Activity under the authority, direction, and control of the USD(AT&L)
  - Review and provide oversight of proposed DoD budgets and expenditures for T&E facilities and resources
  - Develop a biennial Strategic Plan reflecting the needs of DoD with respect to T&E facilities and resources
  - Review the Services’ proposed T&E budgets for adequacy and certify that they are in compliance with the Strategic Plan
  - Administer CTEIP and the Test And Evaluation/Science And Technology Program
- Nuclear Weapons Effects (NWE) has been a “Focus Area” in the last three DoD Strategic Plans (2007, 2009, 2010) and will continue as a “Focus Area” in Strategic Plans – 2012 and beyond as long as there is a NWE requirement
U.S. Code
Title 10, Section 196 (d)

“…The strategic plan shall be based on a comprehensive review of the test and evaluation requirements of the Department and the adequacy of the test and evaluation facilities and resources of the Department to meet those requirements…."

Six statutory requirements:

(1) An assessment of the T&E requirements of the Department for the period covered by the plan.
(2) An identification of performance measures associated with the successful achievement of T&E objectives for the period covered by the plan.
(3) An assessment of the T&E facilities and resources that will be needed to meet such requirements and satisfy such performance measures.
(4) An assessment of the current state of the T&E facilities and resources of the Department.
(5) An itemization of acquisitions, upgrades, and improvements necessary to ensure that the T&E facilities and resources of the Department are adequate to meet such requirements and satisfy such performance measures.
(6) An assessment of the budgetary resources necessary to implement such acquisitions, upgrades, and improvements.
Inputs to and Outputs of the Strategic Plan

**Top-Down Inputs**
- IPLs
- STAR
- MDAP
- GDF
- QDR
- NSS
- Requirements Assessment & Analysis

**Bottom-up Inputs**
- I&M Reviews
- MRTFB Infrastructure Review
- Service Briefs
- Reliance Process
- MDAPs
- TEMPs
- KPPs
- CDDs

**Strategic Plan**
- T&E Capability Needs:
  - T&E Facilities
  - T&E Workforce
  - T&E Investments

**Outputs**
- Inform Congress for Appropriations and Legislation
- T&E Operations and Investments
- T&E Budget Certification
- T&E Investments
Translating Statute into Process

Strategic Plan
Systems Engineering Approach

Legal Requirements of Statute

Comprehensive Review
Review MDAPS and National-level priorities; Assess for impacts to DoD T&E

Assessment of primary DoD T&E Requirements
What are the primary DoD T&E requirements?

Assessment of T&E facilities and resources
What is the current state of DoD T&E Infrastructure?

Itemize upgrades and improvements
What facilities and resources are needed to meet T&E requirements?

Assessment of budgetary resources
What investments are needed to fulfill resource demands?

Strategic Planning Goal 1:
Research Areas and Working Group Outreach

Strategic Planning Goal 2:
Identify DoD T&E Requirements

Strategic Planning Goal 3:
Review current T&E Infrastructure

Strategic Planning Goal 4:
Identify T&E Capability Needs

Strategic Planning Goal 5:
Provide Recommended Actions

Systematically Map End-to-End
Institutionalize approach establishing a standard to link:
Warfighter requirement needs → testing → back to mission capability
## Domain and Focus Area Working Groups

<table>
<thead>
<tr>
<th>Capability Areas</th>
<th>Served by established DoD Working Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air, Land, Sea</td>
<td>Reliance Panels</td>
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<tr>
<td>Space and Missile Defense</td>
<td>SMD JAT, IIPT, OIPT, WG Successor to JAT/OIPT</td>
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<tr>
<td>Cyberspace</td>
<td>IO EXCOM</td>
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<tr>
<td>Artificial Intelligence</td>
<td>Strategic Planning Working Group</td>
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<tr>
<td>Biometrics</td>
<td>DoD PEO Biometrics T&amp;E WIPT</td>
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<tr>
<td><strong>Chemical-Biological Warfare</strong></td>
<td><strong>CSOG-ChemBio, Rad/Nuc T&amp;E Standards - DUSA TE CBRND TECMIPT</strong></td>
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<tr>
<td>Directed Energy</td>
<td>DETEC Working Group</td>
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<tr>
<td>Electronic Warfare / C-IED / Anti-Access</td>
<td>Strategic Planning Working Group, JIEDDO, and JTB</td>
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<tr>
<td>Hypersonics</td>
<td>Joint Technology Office on Hypersonics IPT</td>
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<tr>
<td><strong>Nuclear Weapons Effects</strong></td>
<td><strong>CSOG-N, Defense Science Board</strong></td>
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<tr>
<td>Spectrum Stewardship</td>
<td>Range Spectrum Requirements Working Group (RSRWG) and the C-Band Working Group</td>
</tr>
<tr>
<td>Testing in Joint, Net-Centric, and Distributed Test Environments</td>
<td>TRMC T&amp;E/S&amp;T Program Net-Centric Test Technology Area, TRMC-led DIACAP Tiger Team</td>
</tr>
<tr>
<td>Targets and Threats</td>
<td>Threat Systems Working Group (TSWG), Target Investment Working Group (TIWG), Reliance Panel</td>
</tr>
<tr>
<td>Unmanned and Autonomous Systems</td>
<td>UAS Task Force, Joint Program Robotics Office, and Joint Ground Robotics Integration Team (JGRIT)</td>
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</tbody>
</table>
DoD Process for Establishing T&E Standards

- CBRND T&E Executive establishes DoD CBRND T&E standards, through T&E Capabilities and Methodologies IPT (TECMIPT)
  - Interagency partners now participating in TECMIPT process
- SMEs in TECMIPT CBRN commodity area sub-groups provide rigor to T&E standards development
Rad/Nuc TECMIPT Sub-Group
Interagency Members

DoD

- Defense Threat Reduction Agency (DTRA)
- Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD)
- Joint Requirements Office, CBD (JRO-CBD)
- Army T&E Command (ATEC)
- Air Force Operational T&E Command (AFOTEC)
- Navy Commander, Operational T&E Force (COMOPTEVFOR)
- Marine Corps Operational T&E Activity
- Naval Surface Warfare Center, Dahlgren Division (NSWC-DD)
- White Sands Missile Range (WSMR)
- US Army Radiation Standards Laboratory (RSL)
- Dugway Proving Ground (DPG), West Desert Test Center (WDTC)

Department of Homeland Security (DHS)

- Domestic Nuclear Detection Office (DNDO)

National Institute of Standards and Technology (NIST)

Environmental Protection Agency (EPA)

Department of Energy (DOE) National Laboratories:

- Pacific Northwest National Laboratory (PNNL)
- Oak Ridge National Laboratory (ORNL)
- Idaho National Laboratory (INL)
Rad/Nuc T&E Standard
Near-Term Priorities

1. Review existing Rad/Nuc consensus T&E standards currently used by federal agencies. Combine, modify and/or update as necessary and provide interagency concurrence on T&E standards for:
   a. Detection: The CAPAT has identified five detection technologies to be addressed first:
      • man-portable systems (i.e. backpacks and Radiation Isotope Identification Devices (RIIDs))
      • Aerials systems
      • Vehicle-mounted systems
      • Personal Radiation Detectors (or PRDs, also referred to as Pagers )
      • Boat-mounted systems.
   b. Rad/Nuc personal protection systems, to include dosimeters and individual protective ensembles
   c. Rad/Nuc decontamination systems

2. Support PM procurement of COTS items
   a. Develop a Rad/Nuc T&E program for COTS vendor participation to reduce redundant government testing
   b. Identify and leverage existing government test data for COTS equipment that can be shared across agencies.
Rad/Nuc T&E Standard
Mid and Long-Term Priorities

1. Identify/Prioritize Rad/Nuc T&E capability gaps, develop requirements (Test and Evaluation Capability Needs (TECN) statements) for new Rad/Nuc T&E infrastructure to fill the gaps.

2. Develop and/or review the validation plans and reports for the infrastructure in accordance with the “CDBP T&E Standards Development Plan” and the TECMIPT SOP.

3. Identify T&E standardization goals for:
   - Rad/Nuc pre- and post-detonation forensics
   - Effectiveness of filtration for survivability in collectively protected spaces
2010 Strategic Plan and the NWE Focus Area
TRMC Interest in DoDI 3150.09 and the CSOG-N Processes

• Why a NWE Focus Area?
  – Genesis of TRMC interest based on the same concerns that drove DoD to the new DoDI 3150.09, the CSOG process, and establishment of the permanent DSB Task Force on Survivability of DoD Systems and Assets to EMP and other Nuclear Weapons Effects
  – 11 Senior, “Flag” Level Task Force Studies, and Congressional Commission Studies focused on the Department’s Nuclear Enterprise and the need for paying more attention to both the Nuclear Enterprise and the nuclear survivability requirements of systems

  • All studies found a systemic atrophy across the Department regarding “Things Nuclear”

• To date, the Strategic Plans have deferred any assessment of the adequacy of the NWE test infrastructure because the processes to refocus the Department on nuclear survivability were just beginning and “user” NWE test requirements were lacking
  – Requires assessment of “user needs” versus adequacy of test infrastructure
  – “User test needs” are just evolving as the Service/Agency Mission Critical Lists mature

• TRMC is collaborating with DATSD/NM in the CSOG-N process and are participating in the on-going permanent DSB on nuclear survivability
  – The Department is analyzing the Service/Agency Mission Critical Lists (2010 Version & Expected Mid Year Update) to extract NWE test infrastructure needs

• Bottom Line Goal: To be able to assess infrastructure adequacy in future Strategic Plans based on “user needs”
The 2010 Strategic Plan was developed in-parallel with on-going CSOG activity and released for publication on 30 Nov 10

NWE Focus Area

- Documents the Department’s re-emphasis on the Nuclear Enterprise
  - Past Senior TF Studies
  - DoDI 3150.09, CSOG-N, and DSB Implementation Plans
- Defers assessment of T&E Resource Adequacy pending anticipated “requirements” evolving from the CSOG-process

CSOG-N T&E WG formed to address T&E and T&E resource issues/needs resulting from the CSOG –N process for future Strategic Plans

- Co-Chaired by TRMC and DTRA
- Membership from T&E, OSD nuclear communities, Services, and MDA
- Kick-off meeting held on 14 Feb 10; 2nd meeting held on 14 Jul 10
- Will provide a “user requirements vetting forum” for EMP, X-ray, gamma ray, neutron, blast, thermal, disturbed environments simulators in the 2012 Strategic Plan
- Assures DoD and DOE limited set of simulators is sustained to meet anticipated testing requirements expected to evolve from the CSOG-N process
- Currently analyzing the 2010 MCLs and assessing the data therein
- Process will be re-invigorated in late summer or early fall after the MCLs mature
CSOG-N T&E Sub-Group

Subject Matter Expertise
- Conventional T&E
- CBR T&E
- Limited NWE

Subject Matter Expertise
- NWE
- CBR
- Limited T&E

CSOG-N NWE Community Reps
- DATSD/NM
- DOT&E
- DDRE
- JCS
- DTRA
- DISA
- MDA/DE
- OPNAV N
- NAVSEA
- NAVAIR
- NSWC
- DUSA/TE
- USANCA
- WSMR/SVAD
- AF A-5XP
- AF A10R
- USSTRATCOM
- TRMC

Co-Chaired By TRMC & DTRA

CSOG-N T&E Sub-Grp.

OSD, Service, Agency T&E POCs

CBRN POCs

10 Focus Area WGs

6 Domain Area WGs

T&E Community Reps
- AF/TE
- DOT&E
- ASD(RE)/DT&E
- OPNAV N-81
- MDA/TE
- TRMC

Svc & Agency TE Orgs

T&E POCs

Dir TRMC

Dep. Dir SP

USD AT&L

ATSD/NCB

DATSD/NM

DATSD/CB

CSOG

CSOG-CBR

CSOG - N
Framework for the CSOG-T&E Sub-Group

• **The Way Ahead** – Questions we hope to be able to answer in future Strat Plans
  - Which Mission Critical Systems have **nuclear “operate though” requirements**?
    • **HEMP**, X-ray, Gamma Ray, Neutron, Blast, Thermal, Disturbed Environments
  - Will the **“operate thru” capability** be achieved by **TTP** and/or **hardening**?
    • Nuclear Command And Control (NC2) system facilities and equipment, must be nuclear hardened and have a continuing Hardness Maintenance And Hardness Surveillance (HM/HS) program
  - For systems with **nuclear hardness requirements**:
    • What is the plan to assess their **vulnerability** and **survivability**?
    • Which, if any” **HEMP**, X-ray, Gamma Ray, Neutron, Blast, Thermal, Disturbed Environment simulators will be needed?
      - For legacy systems with vulnerabilities that will be resolved by “hardening,” **which simulators will be needed to assess hardening adequacy**?
      - Which simulators will be needed for any **planned or existing HM/HS programs**?
  - **Output** will get more granular over time and will feed:
    - The development of future DoD Strategic Plans For T&E Resources
    - The Permanent DSB on Nuclear Survivability
    - Follow-on CSOG-N processes (future updates to Mission Critical Lists)
Recommended Actions *(from the 2010 Strategic Plan)*

- TRMC will continue to collaborate with DATSD (NM) through the CSOG-N, CSOG-N T&E Sub-group, and Permanent Nuclear Survivability DSB Processes over the coming years to identify NWE test requirements, assess the adequacy of the NWE simulation infrastructure, and identify capability needs of NWE test resources. **TRMC recommends the DSB monitor NWE test and simulation infrastructure, as well as the availability of a skilled workforce.**

- Infrastructure Capability Need: **White Sands Solar Furnace**
  - **Recommended Action:** TRMC monitor the Army plan to bring the Solar Furnace back to full operational capability.

- Infrastructure Capability Need: **DTRA's West Coast Facility (WCF)**
  - **Recommended Action:** DTRA (with assistance from the CSOG-N T&E Sub-group and the DSB Task Force on Nuclear Survivability) should develop and implement a new facility sustainment plan based on projected program needs before the current contract with L-3 Communications expires in January 2013.

- Identifies **an initial baseline set of core NWE T&E facilities** that need to be sustained pending the DoDI 3150.09, CSOG-N implementation process, and DSB Nuclear Survivability Task Force Review. **(see Next VGs)**
### Core Facilities that Need to be Sustained (per 2010 Strategic Plan)

<table>
<thead>
<tr>
<th>NW Environment</th>
<th>Test Facilities</th>
<th>Use</th>
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</table>
| **Prompt and Modified Neutron**                     | SNL SPR III (or equivalent)*  
SNL ACRR  
WSMR FBR (also combined gamma)  
LANSCE, IBL, and RTNS | For nuclear warhead subsystem space simulations  
For nuclear warhead components  
For ground and air systems, missiles, satellites and interceptors  
For component tests and model validation |
| **Prompt Cold X-rays** (Plasma Radiation Source)     | SNL Upgraded SATURN and/or DTRA  
WCF Double Eagle**  
LLNL NIF and/or SNL ZR | For space system components/optics  
For future RV/RB materials and interceptors |
| **Prompt Warm/Hot X-rays** (Bremsstrahlung source)   | SNL Upgraded Saturn and/or DTRA  
WCF PITHON**  
DTRA WCF** & AEDC Modular Bremsstrahlung Source (MBS) | For medium dose electronics and cables  
For hardness surveillance and low-dose boxes |
| **Prompt Gamma & Gamma Total Dose (GDT)**            | HERMES III  
DTRA WCF Pulserad 1150**  
WSMR Pulserad 538  
Hill AFB Pulserad 958  
WSMR REBA  
WSMR LINAC  
GRF-GTD  
Eldorado-GDT | High dose-rates for strategic systems  
Low dose-rates for satellites and interceptors  
GDT for systems and large components  
GDT for electronic devices and components |

**Sustain until an alternative is available, tested and certified**

*Not Currently Available*
### Core Facilities that Need to be Sustained (per 2010 Strategic Plan) – cont’d

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<tr>
<th>NW Environment</th>
<th>Test Facilities</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMP</strong></td>
<td>WSMR HPD-2, HAG-1</td>
<td>For Army systems</td>
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<td></td>
<td>WSMR Advanced HPD (AHPD)</td>
<td>New E1 HEMP waveform facility</td>
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<tr>
<td></td>
<td>WSMR Pulse Current Injection Fac. (PCI)</td>
<td>For life cycle HA/HM/HS testing</td>
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<tr>
<td></td>
<td>NAWC HPD, VPBW</td>
<td>For large ground and air systems</td>
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<tr>
<td>SREMP</td>
<td>HERMES III</td>
<td>For Army vehicles and field C3 systems</td>
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<td></td>
<td>Current Injection Test (CIT)</td>
<td>For installations and equipment</td>
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<tr>
<td>Impulse</td>
<td>LIHE</td>
<td>For RV/RB internal components/mounts</td>
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<tr>
<td></td>
<td>Flyer-plate (Magnetic or LIHE)*</td>
<td>For future RV/RB aeroshells</td>
</tr>
<tr>
<td>Blast, Thermal, and Shock</td>
<td>WSMR LBTS</td>
<td>For ground vehicles, structures, antennae</td>
</tr>
<tr>
<td></td>
<td>SNL Thunder Range</td>
<td>For RV/RB systems</td>
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<tr>
<td></td>
<td>WSMR Solar Furnace*</td>
<td></td>
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<tr>
<td>Disturbed Atmospheric RF/IR/Visible</td>
<td>NSWC Advanced Channel Scintillation (ACS)</td>
<td>For MILSATCOM, interceptor in-flight comm. and seekers</td>
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<tr>
<td></td>
<td>Nuclear Optical Dynamic Display System (NODDS)</td>
<td></td>
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<tr>
<td></td>
<td>Radar Nuclear Corrupter &amp; Simulator (RNECS)</td>
<td></td>
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<tr>
<td>Combined Radiation Environments</td>
<td>WSMR Combined Radiation Environment (CRE) Facility</td>
<td>Provides an exoatmospheric gamma-neutron environment for synergistic testing</td>
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</table>

**Sustain until an alternative is available, tested and certified**

*Not Currently Available*
Where We Are Today In The CSOG-N Process (TRMC Perspective)

- Services/Agencies have identified 400+ CBRN Mission Critical Systems (MCSs)
- What we hope to glean from the Mission Critical System Lists (MCLs) is a macro view of:
  - MCSs with mission requirements to operate through a nuclear and/or EMP environments
    - Which have documented “Hardness Requirements” for survivability
    - Which will use TTPs for survivability
  - MCSs with HM/HS programs
  - Which MCSs have been tested for survivability and which need to be tested
    - The MCLs are still maturing and in many cases lack detail – impetus for a mid-year update
- A sub-set of these systems will require DoD and/or DOE NWE simulator capabilities
  - To assess the vulnerability of legacy Mission Critical Systems
  - To assess the hardness of Mission Critical Systems with nuclear hardness requirements (both legacy and new)
  - To Support Hardness Maintenance/Hardness Surveillance Programs
- Depending on the system, vulnerability/hardness assessments may be required for:
  - Electromagnetic Pulse (EMP) and High Altitude EMP (HEMP) effects
  - X-Ray Effects
  - Gamma Ray Effects
  - Neutron Effects
  - Blast & Thermal Effects
  - Disturbed Environment Effects
- DoD and DOE have simulators for these effects but their adequacy is dependent on user requirements (capacity and technical requirements)
The DoD initiative to identify and correct deficiencies of systems with requirements to operate through nuclear (including EMP) environments is still at the beginning stage.

TRMC will continue collaboration with DATSD (NM) in these activities and expects more definitive NWE test and test resource requirements to emerge over the next two years.

For this Strategic Plan, the NWE test facilities and simulators identified in Table B9-1 require sustainment to meet evolving NWE test requirements as they emerge from the DoDI 3150.09 implementation process.
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Questions ?
Backup
NWE “Drivers” (Re-awakening To NWE )  
Flag Level Studies Addressing NWE Within DoD

- 2004 - Rpt of Commission To Assess The Threat To The US Of EMP Attack – Dr. Graham
- Dec 06 - DSB Report on Nuclear Capabilities, - Gen Welch (Ret) /Dr. Foster
- Oct 07 - Joint DSB/TRAC TF The Nuclear Weapons Effects National Enterprise - Dr. John/Joe Braddock
- May 2007- DoD IG Report No. 07-INTEL-07, Audit of DoD EMP Testing & Survivability Capabilities (SECRET),
- Feb 08 - Permanent DSB TF on Nuclear Surety – Rpt on Unauthorized Movement of Nuclear Weapons – Gen Welch (Ret)
- April 08 - Report of Commission To Assess The Threat To The US Of Electromagnetic Pulse Attack – Dr. Graham
- Summer 08 - AF Blue Ribbon Review of Nuclear Weapons Policies & Procedures – Peyer
- Sep 08 - DSB Task Force on Nuclear Skills – ADM Chiles
- Sep 08 – AF Nuclear TF Rpt on “Reinvigorating the AF Nuclear Enterprise” – MG Alston, SecAF Donley, Gen. Schwartz
- Sep 08/Dec08 - Rpt of the SecDef TF on DoD Nuclear Weapons Mgt,— Hon. James Schlesinger
  — AF Review
  — DoD Wide Review
- Sep 08 - SecDef/SecDOE White Paper on “National Security and Nuclear Weapons in the 21st Century” – Hon. Robert Gates/Samuel Bodman
- Dec 08 - Permanent DSB TF on Nuclear Surety, Nuclear Wpns Inspections, Gen Welch (Ret)
- Sep 08 - DoDI 3150.09, Chemical, Biological, Radiological, and Nuclear (CBRN) Survivability Policy
- Apr 2009 – DSB Permanent Task Force on Survivability of DoD Systems & Assets To Electromagnetic Pulse EMP & Other Nuclear Effects, Dr John +