Case Studies on Technology Adoption in Navy Energy and Environmental Technology Projects

Naval Postgraduate School

Abstract

- ***Purpose:*** to create and analyze case studies on Navy energy and environmental technology transition program (TTP) projects
- ***Approach:*** couples research on innovation with interviews of S&T professionals to identify common themes in the adoption of technologies on naval installations. Also, investigates how the Navy's Adoption Readiness Levels may improve technology adoption
- ***Goal:*** to aid decision-makers to more effectively facilitate adoption of energy and environmental technologies on naval installations

ARL		Component Technology TRL	Systems-Level Technology Integration	Stakeholders	Processes
1	Application Identified	5	Potential to satisfy an existing or anticipated need more effectively than alternatives.	N/A	N/A
2	Demonstration Planning	5	Research plan developed, necessary facilities identified.	Stakeholders identified. Need verified.	Funding budgeted for demonstration phase. Approvals required for demonstration identified.
3	Representative Prototype	6	Demonstrated at representative research site. Performance documented.	Pilot performance validated by stakeholders.	Technical approvals required for operational use identified and documented. Testing or modification requirements documented.
4	Representative Demonstration	7	O&S requirements and any training requirements for O&S documented.	O&S funding levels and personnel requirements for sustainable support in operation estimated.	Process for getting technical approvals for operational use has been documented.
5	Fully Adoptable	8	Operating at representative research site or operational site for relevant time period. Performance requirements satisfied and documented.	Validated and accepted by stakeholders, including budget for procurement and ongoing O&S.	All required technical approvals have been received. Any required updates to Unified Facilities Criteria or Guide Specifications have been made or in process of being updated.
6	Adopted	8	In operational use at multiple installations.	Training and communication programs in place.	Technology installed and in operational use.

Navy Adoption Readiness Level (ARL) Framework

(Source: Regnier, E., Barron, R. W., Nussbaum, D. A., & Macias, K. (2017, January-February). Stakeholder and Process Alignment in Navy Installation Technology Transitions. Defense AT&L, 9-12.)

Methods

Researched multiple innovation theories/frameworks:

- Rogers' Five Factors
- Energy Cultures Framework
- Garbage Can Model
- Affect of Professions on Communities of Practice
- Navy Adoption Readiness Levels (ARLs)

Compiled five project case studies:

- NoFoam System for Automotive Fire Apparatus (NESDI/ESTCP)
- NoFoam System for Aircraft Hangar Fire Suppression (NESDI/ESTCP)
- Zero VOC, Coal-tar Free Splash Zone Coating (SBIR/ESTCP)
- Magnetic Bearing Chiller Compressor (TECHVAL)
- SPIDERS (JCTD)

Results

Research Questions: (Analysis not yet complete)

- What does "successful technology adoption" mean to S&T professionals?
- What barriers have prevented the adoption of technologies in TTPs?
- What factors contribute to successful adoption of technologies?
- How might ARLs aid or improve technology adoption at naval installations?

NoFoam System Nozzle Discharge Check at NAS Lemoore, CA

(Source: Kudo, R. T. (2010). NoFoam System for Automotive Fire Apparatus Vehicle Foam Discharge Checks. Port Hueneme, CA: NAVFAC)

NoFoam System Nozzle Discharge Check at Arizona ANG, Tucson, AZ

(Source: Kudo, R. T. (2011). NoFoam System Technology For Aircraft Hangar Fire Suppression Foam System - Final Report. Port Hueneme, CA: NAVFAC)

Zero VOC, Coal-tar Free Coating Application at NAS Pensacola, FL

(Source: Gaughen, C. D., Pendleton, D. E., & Zarate, D. A. (2010). Zero VOC, Coal Tar Free Splash Zone Coating (SZC) - Final Report. Port Hueneme, CA: NAVFAC)

Magnetic Bearing Chiller Compressor Installation at NRSW San Diego, CA

(Source: Kistler, P., Personal Email (2018), NAVFAC)

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