WEQ OASIS Subcommittee Assignments

On July 22, 2019, Sandia National Laboratories provided NAESB with the final reports on the surety assessment: (1) Assessment Report of the NAESB Public Key Infrastructure Program; (2) Assessment Report of the NAESB OASIS Standards; (3) Assessment Report of the NAESB Business Operations Practices and Standards; and (4) Addendum Report: Threat-based Examination of NAESB Standards and Business Operations. In anticipation of these reports being delivered, NAESB included on its 2019 Annual Plans a review of the final reports and the development and/or modifications of NAESB Business Practice Standards as needed to address recommendations from Sandia National Laboratories. The Department of Energy has requested that, where possible, NAESB expediate any resulting standard development. To assist in these efforts, the Critical Infrastructure Committee has committed to reviewing the final reports to provide context to any recommendations containing actionable items for standards development.

**Assessment Report of the NAESB OASIS Standards**

Security Issues

The first section of this work paper addresses items identified as part of Section 6.1 Security Issues of the Assessment Report of the NAESB OASIS Standards and contains the specific standard development efforts identified by the Board Critical Infrastructure Committee that NAESB should consider in response. As indicated by Sandia National Laboratories, Section 6.1 addresses “vulnerabilities that could provide an opportunity to an attacker to conduct malicious activities that would affect the availability or security of OASIS Nodes, compromise the sensitive information stored on those nodes, or interrupt business transactions conducted using OASIS.” As part of Section 6.1, Sandia National Laboratories has identified two areas of vulnerability: Section 6.1.1 Significant Amounts of Sensitive Information Are Posted on OASIS and Section 6.1.2 Implementation Details for OASIS Nodes Not Specified. Within these two subsections, Sandia National Laboratories has provided five recommendations to address the identified vulnerabilities.

Sandia National Laboratories assigned a level of severity for each vulnerability: (1) High – represents a systemic weakness which could allow an adversary to directly and/or covertly conduct malicious activity; (2) Moderate – represents a weakness which could allow an adversary to conduct malicious activity and cause considerable degradation of operations; or (3) Low – represents a weakness which could allow an adversary to conduct malicious activity and cause targeted or limited impact on the mission.

The table below captures the recommendations identified within Section 6.1 Security Issues and the corresponding standard development activities to address these recommendations assigned to the WEQ OASIS Subcommittee and jointly to the WEQ OASIS Subcommittee and WEQ Cybersecurity Subcommittee.

| **Issue** | **Report Section (Page Number)** | **Sandia Recommendation** | **Recommended Standards Development Activity** | **Recommended Assignment** |
| --- | --- | --- | --- | --- |
| 2. | OASIS Report Section 6.1.1 – Significant Amounts of Sensitive Information are Posted on OASIS (Pages 11 – 12)  | Level: LowThe assessment team recommends review of NIST SP 800-63-3 section 4.1.1 and review for implementation new approved technologies supporting authentication methods. | There is not a Section 4.1.1 in NIST SP 800-63-3, but [NIST SP 800-63-3B Authentication and Lifecycle Management](https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-63b.pdf) does have a Section 4.1.1 Permitted Authenticator Types that identify nine different authenticator types and Section 5 Authenticator and Verifier Requirements contain detailed requirements for each type of authenticator. The Addendum Report Section 2.3.2 states that the authentication method in the OASIS Standards (WEQ-002-5.1.1) is considered adequate and consistent with current business practicesReview the current OASIS requirements for authentication, especially regarding passwords, against the recommended best practices in NIST SP 800-63-3B and revise standards as needed. | Jointly between WEQ OASIS Subcommittee and WEQ Cybersecurity Subcommittee |
| 3. | OASIS Report Section 6.1.1 – Significant Amounts of Sensitive Information are Posted on OASIS  | Level: LowAdditionally, the assessment team recommends that WEQ-002 be reviewed with consideration to incorporate NIST 800-52 details for TLS version and associated configurations which currently requires version 1.2 and support for version 1.3 by January 1, 2021. Specific configurations for TLS servers and TLS versions are detailed in section 4 of NIST 800-52 and the specific server implementation is dependent on the TLS version and implementation strategy. SSL protocol is disallowed for both government and business – facing applications and as such, the assessment team recommends disallowing support for SSL version protocols and removal of references to SSL versions and exclusively callout TLS version 1.2 configured with validated FIPS-140-2 modules[[1]](#footnote-1) | The subcommittees should review TLS/SSL references and update the standard(s) accordingly as recommended | Jointly between WEQ OASIS Subcommittee and WEQ Cybersecurity Subcommittee |
| 4. | OASIS Report Section 6.1.1 – Significant Amounts of Sensitive Information are Posted on OASIS  | Level: LowThe team recommends that the OASIS Subcommittee consider the sensitivity of historical information and determine what information can be removed on a quarterly basis; | Subcommittee should review all OASIS standards that specify data retention. | WEQ OASIS Subcommittee |
| 5. | OASIS Report Section 6.1.2 – Implementation Details for OASIS Nodes Unspecified (Pages 12 – 14)  | Level: LowTo mitigate this issue, the assessment team recommends that all OASIS nodes follow industry best practices to secure their systems. This would include, but is not limited to: * Ensuring web applications are secure against common vulnerabilities such as the OWASP Top 10[[2]](#footnote-2) OWASP addresses common vectors for attack, and methods for prevention for each identified security risk.
* Encrypting all communications (as allowable) using an encryption module that is validated against FIPS 140-2[[3]](#footnote-3),[[4]](#footnote-4) . The assessment team recommends removal of HTTP communication for status notifications and utilizing either HTTPS solutions or utilize encrypted email notification. In section WEQ-002-5.1 appears to require encrypted communication but in WEQ-002-4.2 allowances are made for HTTP notifications. NIST SP 800-131A REV 2 provides guidance for acceptable encryption (AES 128 bit or better), random bit generation, hash functions and message authentication codes.
* Utilizing the latest versions of all critical standards (such as TLS) to ensure all possible vulnerabilities are addressed
* Verifying and validating all external inputs
* Conducting business continuity and disaster recovery exercises on an annual basis
* Applying patches and updates in a timely manner; ideally no longer than 7 days after the patch or update becomes available (if practical). It is imperative that implementation details, system configurations, and software dependencies be considered prior to applying updates as some updates can have a detrimental impact on functionality. Any of these items that have an impact on the update process must be tracked and communicated to dependent parties.
 | Subcommittees should consider additional standard(s) ensuring web applications are secure against common vulnerabilities such as the OWASP Top 10Subcommittees should review encryption of OASIS data and references to HTTP/HTTPS as recommended and modify standards as neededSubcommittees should consider standard(s) to require business continuity and disaster recover exercises on an annual basis as recommendedSubcommittees should consider standard(s) to require applying patches and updates in a timely manner; ideally no longer than 7 days after the patch or update becomes available as recommended | Jointly between WEQ OASIS Subcommittee and WEQ Cybersecurity Subcommittee |

**Addendum Report: Threat-based Examination of NAESB Standards and Business Operations**

Additional Findings and Considerations

This part of the work paper identifies the additional findings and considerations identified by Sandia National Laboratories in the Addendum Report: Threat-based Examination of NAESB Standards and Business Operations and the related standard development activities identified by the Board Critical Infrastructure Committee that NAESB may want to consider in response. As part of this report, Sandia National Laboratories identifies ten considerations across six different sections: Section 2.3.1 EDI Cyber Attack, Section 2.3.2 Ukrainian Power Grid Attack, Section 3.1 Trends in Operation, Section 3.2 Government and Industry Standards, Section 3.3 Emerging Technologies, and Section 3.4 Recommended Future Assessments.

The table below captures the findings and the related standard considerations to potentially incorporate the identified concept into the standards, as applicable, assigned jointly to the WEQ Cybersecurity Subcommittee and WEQ OASIS Subcommittee.

| **Issue** | **Report Section (Page Number)** | **Sandia Finding or Consideration** | **Standards Considerations (if applicable)** | **Assignment (if applicable)** |
| --- | --- | --- | --- | --- |
| 9. | Addendum Report Section 3.4 – Recommended Future Assessments (Pages 29 – 30) | Since OASIS nodes are implemented independently, the team recommends conducting internal and external scans of the nodes on a quarterly basis, and a security assessment or penetration test. This testing would allow the identification of nodes that are using older/vulnerable versions of software, leak information about the system (ex. list software versions being used) or have vulnerable implementations of their web applications. Since each node can be unique in its software, environment, and supporting security systems, the assessment team recommends that the node owner perform these assessments on their own systems. According to best practices from SANS[[5]](#footnote-5): “Scans should be performed regularly on all software, services, or platforms (SPPs) that are available external to the organization. At a minimum, scans should be performed monthly.” | Subcommittees should review the recommendation and consider standard(s) recommending best practices or requiring internal/external scans of nodes and a security assessment/penetration test as recommended | Jointly between WEQ Cybersecurity Subcommittee and WEQ OASIS Subcommittee |

1. NIST 800-52 section 3.1 Protocol Version Support <https://csrc.nist.gov/CSRC/media/Publications/sp/800-52/rev-2/draft/documents/sp800-52r2-draft2.pdf> [↑](#footnote-ref-1)
2. <https://www.owasp.org/images/7/72/OWASP_Top_10-2017_%28en%29.pdf.pdf> [↑](#footnote-ref-2)
3. FIPS 140-2: <https://nvlpubs.nist.gov/nistpubs/FIPS/NIST.FIPS.140-2.pdf> [↑](#footnote-ref-3)
4. Validated encryption modules: <https://csrc.nist.gov/Projects/Cryptographic-Module-Validation-Program/Validated-Modules> [↑](#footnote-ref-4)
5. <https://www.sans.org/security-resources/policies/application-security/pdf/web-application-security-policy> [↑](#footnote-ref-5)