***DRAFT* White Paper:**	**Automated Efficiency for Technical Spare Parts - Deprecated Inventory Scoring System (*AETS-DISS*)**
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A. Technical Concept

The dynamic nature of national defense and global security necessitates the continuous evolution and expansion of alliances to address emerging challenges and threats. In this context, the Deprecated Inventory Scoring System (DISS) has been developed to optimize the management of deprecated technical spare parts within the U.S. Department of State, ensuring the operational readiness and reliability of security technology. Inspired by the Common Vulnerability Scoring System (CVSS) used in cybersecurity, DISS translates complex inventory issues into clear, actionable values, enabling logistics specialists to make informed decisions swiftly.

> "Logistics Specialists within Diplomatic Security need an automated inventory management system that integrates with their systems of record (CMMS) in order to more efficiently address equipment disposition, reduce cumbersome manual processes, and ensure that Security Technology maintains a minimum but viable number of spare parts" (Hacking for Diplomacy 2024)

The current system for managing deprecated parts is severely outdated and does not meet the needs and requirements of the U.S. Department of State Bureau of Diplomatic Security. Field offices must apply for task orders on deprecated parts at the discretion of the Sole Deposition Repository's Security Technology Assistance Center. Decisions on these parts are typically made weeks after a report is submitted. This system also fails to share valuable security data with all relevant individuals, leaving them often unaware of the security and legal responsibilities associated with individual parts.

This project proposes three key extensions to the current CMMS system: enhancing the integration of the inventory management system with existing systems of record to streamline equipment disposition processes, introducing a new automated tool to assist in the decision-making process for determining the status of deprecated parts, reducing delays and improving efficiency, and ensuring that all relevant individuals have access to critical security data, enhancing awareness of security and legal responsibilities associated with each part.

These enhancements aim to balance the workload between domestic and field office logisticians, improving the efficiency and effectiveness of the inventory management process within the Bureau of Diplomatic Security.

Task 1: Item Sensitivity and Confidentially Score (ISCS): The Item Sensitivity and Confidentiality Score (ISCS) is a pivotal component of the Diplomatic Inventory Security System (DISS), providing an automated method for assessing the sensitivity and confidentiality of each inventory item. This system is designed to enhance the management of technical spare parts, with values assigned by domestic field office officials who possess advanced knowledge of the legal and technical requirements of each part.

The ISCS offers a structured format for evaluating the sensitivity and confidentiality of items, ensuring their proper handling throughout their lifecycle. This is crucial for the security and operational readiness of U.S. diplomatic facilities. By systematically evaluating items within the Computerized Maintenance Management System (CMMS) as they are entered, the ISCS ensures compliance with legal and practical requirements, thereby reducing the risk of mishandling sensitive parts and enhancing the resilience of diplomatic operations.

The ISCS assigns a score between 0.0 and 10.0 to each item, based on the following factors: Legal Requirements: Compliance with laws and regulations. Economic Implications: Costs of handling, storing, and disposing. Practical Handling Considerations: Feasibility of handling procedures. This score is integrated into the CMMS, allowing logistics specialists to make quick, informed decisions.

Score	Description	Example
0.0-2.0: No Requirements	Items in this range can be disposed of or recycled without special instructions.	WIRE500 – ISCS: 0.1, No Requirements
2.1 - 4.0: Basic Handling	Minimal handling is required, following standard disposal or recycling protocols.	CABL200 – ISCS: 3.5, Basic Handling
4.1 - 6.0: Moderate Sensitivity	Specific handling is needed, such as wiping data or securely packaging parts.	MODU300 – ISCS: 5.0, Ensure Data Wiped
6.1 - 8.0: High Sensitivity	Careful handling is required, including removing sensitive components like hard drives before disposal.	SENS400 – ISCS: 7.5, Remove Hard Drive
8.1 - 10.0: Ship Back Domestically	Extremely sensitive items must be shipped to a domestic facility for secure processing.	ALRM1294 – ISCS: 9.5, Ship Back Domestically

Table 1: Sensitivity Tiers and Handling Requirements

To further guide the handling process, additional tags may be included with the ISCS. These tags provide specific instructions for handling certain items, ensuring that all necessary precautions are taken.

Task 2: Deprecated Inventory Form (DIF): The Deprecated Inventory Form (DIF) is a standardized reporting process for deprecated parts, ensuring that field offices can quickly and accurately evaluate each part. The DIF requires values between 0.0 and 10.0 for each metric logistician to value deprecated parts, this includes stock levels, production status, warranty status, and more. The form is designed to be completed easily and quickly by field offices to reduce the complex nature of deprecated parts to easily accessible and usable data.

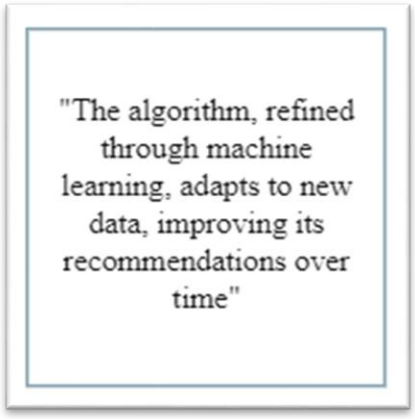
Metric	Description
Current Stock Levels (CSL)	Ratio of used stock to current stock levels
Manufacturer Production Status (MPS)	Production status of the part
Warranty Status (WS)	Warranty status of the part
Condition of Parts (CP)	Physical state of the part
Supply Constraints (SC)	Scarcity of the item
Usage Reports (UR)	Frequency and intensity of use
Space Constraints (SP)	Size and weight of the part
Economic Considerations (EC)	Price of the item

Table 2: DIF Considerations

This form was designed to streamline the reporting process for field offices, convert deprecated parts into a simple data structure that can be easily implemented in automated systems, and create a standard for all deprecated parts to ensure consistent and accurate evaluation. By doing so, we aim to enhance efficiency and reliability while remaining thoughtful of the parties tasked with completing this form.

Task 3: DISS Algorithm: The DISS Algorithm enhances decision-making for managing deprecated technical spare parts by integrating the Item Sensitivity & Confidentiality Score (ISCS) and metrics from the Deprecated Inventory Form (DIF). It evaluates each part's status to determine appropriate actions, ensuring efficient handling and maintaining the operational readiness and security of U.S. diplomatic facilities.

The algorithm can be implemented through any manner of data structures or decision-making processes. However, through our research a system which employs a neural network would be the most effective and provide a bevy of additional benefits.

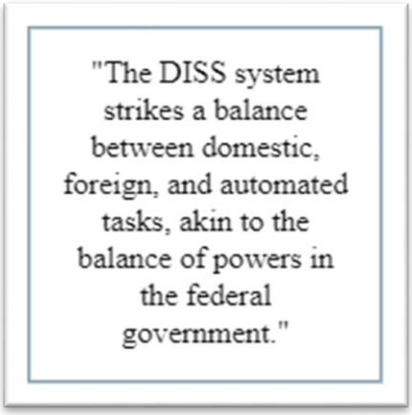


In any implantation of the algorithm nodes corresponding to DIF fields and an output node indicating what task order is recommended for the part. The algorithm is designed to automate decision-making, thereby reducing the workload on logisticians. It integrates data from ISCS and DIF, providing a comprehensive evaluation of each part's status and generating recommendations that are both accurate and timely.

Task 4: Full System Implementation: The implementation of DISS involves integrating the system with existing processes and providing training and support for users. This ensures a smooth transition from current systems to DISS, enhancing inventory management efficiency and supporting the operational readiness of security technology. The system's continuous improvement capabilities, driven by machine learning, ensure that it remains effective and adaptable to changing needs.

B. Future Relevance

The Deprecated Inventory Scoring System (DISS) aligns with and advances the strategic goals of the U.S. Department of State by enhancing the efficiency and reliability of inventory management for technical security spare parts. The implementation of DISS supports the operational readiness and security of U.S. diplomatic facilities worldwide. By automating the evaluation and handling of deprecated parts, DISS reduces the risk of mishandling sensitive components, minimizes unnecessary shipments, and optimizes the availability of critical parts. This system not only improves current operations but also lays the groundwork for future technological integrations, such as IoT and blockchain, to further enhance inventory tracking and security.



C. Metrics of Evaluation

To maintain the constant development and effectiveness of the Deprecated Inventory Scoring System (DISS), there will be an extensive series of tasks that will be used to evaluate its overall performance and stability. These Metrics will play a key role in assessing how the systems change with the new system, some of the areas to monitor will be Inventory management, operational readiness, and just overall efficiency. Key performance indicators (KPIs) include Accuracy of the system- The goal would be around 90/95%. Processing Time- The goal here is to reduce the average time taken to deal with and get parts sent out, within the first year a 30% decrease in time would be ideal. User Satisfaction- Would aim for an 85% rate of approval or satisfaction, this would be achieved through feedback, surveys, or meetings. A Reduction in Any Mishandling Incidents- Would target for around 50% during the first operational year. Alongside that a 15-20% reduction in operational costs. Lastly is Inventory Turnover Rate- The goal is an increase of 15%, With a compliance rate of 100%. This can be easily achieved through audits and compliance and regulation checks.

By keeping constant tabs on all these metrics, the U.S. The Department of State can ensure that the DISS system has been making constant improvements and met all objectives set. Alongside that with constant adjustments and evaluation based on what is ended and these metrics will maintain the systems effectiveness and how it is able to adapt to the Governments ever changing needs.

D. Rough Order of Magnitude (ROM)

The development costs include software development, Machine learning integration. The user interface panel, the program's design, its coding, and testing of the DISS algorithm and the specifics of its integration with CMMS and their current system. The costs for implementation also include the systems integration, the migration for all the data from CMMS to the new system, and any needed training and support for the new system so that everything can go well and smoothly when the transition is complete. As for the operational costs, they include regular maintenance and updates to the system. They also include User feedback and several types of compliance and audits to ensure that the system is running securely and at the peak of efficiency. Some enhancements that could be made in the future could be but are not limited to Blockchain and IoT (Internet of Things) which would allow them to have better tracking and security for the inventory.

It is important that if this is considered, when resources are being sent that a team containing software developers, machine learning specialists, an UI/UX graphic designers, an implementation team for all the data to be transferred, and lastly a support team for constant assistance and maintenance / improvements. As for the infrastructure requirements, that would include hardware like servers to keep everything running, storage solutions, software licenses for the development tools and machine learning tools to make the actual system and everything included in that. The timeframe for this is what we would estimate at a development phase 6-12 months for the initial phase of development and testing. After that there would be an implementation phase with about 3-6 months for integration and training, also an ongoing phase with regular updates, improvements, etc. all based upon feedback. We are not expert coders so the times may be but that is our rough estimate. As for the ROM, it provides an advanced and well put together view into the projected costs and resources required by the DISS project. There will need to be heavily detailed planning and further analysis needed to further refine many of these points and estimates and to ensure that the goals are in complete alignment with the United States Department of State.