

## Example MaintenX RTD Response

**1. Company Name, Address, POC, email, phone**

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**2. Provide an overview of your solution (NTE 200 words)**

Acme's X-Ray Vision provides maintainers with a capability to see beneath paints and coatings to identify and characterize substrate corrosion. Using our patented Flash-Ray technology, shipboard maintainers can rapidly and accurately pinpoint areas of concern and take precision remediation action before significant subsurface damage can occur. Once an area has been "flushed," maintainers wearing AR goggles remediate only those corrosion indications identified and warranted by appropriate instructions. The system is comprised of the Flash Ray technology, software that interprets the indications, patented "lead-foil" masking, protective lead curtains, stray X-Ray detection devices called scintillators, wearable AR devices, and interactive training software. Using X-Ray vision, corrosion detection and remediation are performed in a fraction of the time, using less consumables and significantly reducing maintainer exposure to repetitive injury and hazardous environments.

**3. State the primary MaintenX focus area this solution addresses.**

- a. Navy assets need dynamic visualization and inspection methods to "see" themselves and the world surrounding them. For example, ships need to "see" above and below the water line, inside and outside of the hull.
- b. Navy Commanders need the ability to make rapid, data-driven decisions for Command, Control and Sustainment. Integrating data in from various external sources and from aboard, and displaying holistic Operational Views (OVs) enables real-time situational assessment and rapid, precise shipboard decision making.
- d. The Navy needs an ability to perform maintenance operations underway and in forward locations to improve ships materiel condition and build battle damage repair competencies.

**4. What is the current Technology Readiness Level (TRL) and Manufacturing Readiness Level (MRL) of this solution?**

X-Ray Vision is TRL 9 as it is being widely deployed by commercial shipping operators and shipyards. The MRL is also 9 as the system is being actively manufactured and deployed.

**5. Provide an overview of how and where this solution is being applied in commercial industry and/or for Government? Include benefits (NTE 300 words)**

Currently X-Ray Vision is only being deployed in commercial shipping operations and in commercial shipyards. A major shipper has recently deployed X-Ray Vision systems to all of their cargo vessels. Merchant sailors and ships' engineers have been thoroughly trained in the systems use and are methodically "flashing" sections of the ship while underway. By the time the commercial vessel reports to the shipyard for maintenance, shipyard maintainers have the necessary data to immediately address under-paint corrosion using the AR vision system. The maintenance cycle for commercial ships using X-Ray Vision averages 30 day less than those using legacy corrosion detection and remediation processes.

**6. Outline applicable Environmental, Health and Safety requirements necessary to apply your solution aboard the Self Defense Test Ship (SDTS). (NTE 200 words)**

X-Rays can cause cancer in humans with exposure to levels beyond EPA limits. The X-Ray Vision system's patented lead foil masking has been proven to be safe and effective in protecting ship's crew and shipyard maintainers when used as directed. Radiation Protection Lead Curtains also provide further protection. Vision provides thorough interactive training as part of the complete package and is available to provide on-site training upon request.

**7. Provide an overview of ancillary or support equipment/services necessary to operate your solution; e.g., power requirements, compressed air, PPE, vacuuming, air filtration, lifting devices, etc. (NTE 200 words)**

The Flash-Ray device requires standard 220V power. No other ancillary equipment or support equipment is necessary to operate Flash-Ray. The X-Ray Vision system comes complete with the necessary portable PC and software necessary to operate the AR system, record the data in a MS neutral format, export the data, and provide interactive training to operators.

**8. Describe the portability of your solution including its weight and physical dimensions. If your solution is intended to be used shipboard, please outline how your solution would be moved on and off the SDTS as well as how it would be moved within the ship – through hatchways, up and down ladders, over bulkheads, etc. (NTE 200 words)**

The X-Ray Vision system is packaged in a shock-proof case and has been thoroughly tested for shipboard operations and durability. The complete system is man-portable by 2 operators and has been ergonomically designed for ease of portability and distribution of weight. The system packaging was also designed specifically for portability through ships' hatchways, over bulkheads, and up and down ladderways. Please review our video demonstrating system portability in and around ships.

**9. Describe manpower required to operate your solution including the number of maintainers and requisite skill level and training requirements (NTE 200 words)**

The system is designed to be operated by a single crewman or shipyard artisan with a high school education. The interactive training provided with each X-Ray Vision system has proven extremely effective in providing ships' crew and shipyard artisans with the necessary information to safely and effectively deploy the system only days after initial delivery. Please refer to the demonstration video for further information.

**10. Discuss the set-up process and time as well as anything you can relay regarding the time necessary to execute intended solution-based process. (NTE 100 words)**

It takes only 10 minutes on average to set up the X-Ray Vision system. Most of the set-up time consists of masking areas where X-Ray exposure is undesirable and setting up radiation protection curtains to protect operators and ship's crew. Once set up, the Flash Ray device takes only seconds to capture a 10' X 10' area for corrosion analysis. Depending on the size of the area to be "flashed," it takes roughly 30 minutes to complete the process for an average-sized space aboard ship. System take-down and pack-up requires only 5 minutes and then on to the next area to be "flashed."

**11. Provide a ROM sales price for the solution you intend to demonstrate on the SDTS and any economies of scale you can project.**

The X-Ray Vision system lists for \$45,000.00. This price includes the Flash-Ray system, 100 3'X3' self-adhering lead-foil sheets, a tough-book PC needed to operate the system and collect the data, 10' linear feet of radiation protection curtains, MS-compatible interactive training software, and 2 scintillators for stray radiation detection.

**12. Does the solution require IT equipment to be brought on board SDTS? Yes**

**a. If so, are electronic devices required within the skin of the ship?**

The X-Ray Vision System comes complete with a self-contained portable PC that provides guidance to the system operator and collects the data received from the Flash Ray device. Though it is desirable to connect with the user's network in order to ensure exportability of the data, it is not necessary, and the system can operate completely off-line. In addition, the system comes with AR visioning goggles that connect to the portable PC and focus the maintainer on areas of corrosion concern.

**b. Will the solution require wireless networks? Although desirable to be connected wirelessly to the network, it is not a requirement to be connected.**

**13. Are any unmanned operations (including group 1 UAVs) required? No.**

**14. Does the solution have security requirements/considerations?** No, unless it is intended to be connected to the network.

- a. **Communications Security (COMSEC):** N/A
- b. **Classified document storage:** N/A

**15. Does the solution have Hazardous material storage and disposal requirements?** No.

**16. Describe the concept of operations for testing the solution.**

Acme desires to bring the X-Ray Vision system aboard in the man-portable shock-resistant case the system is packaged in. The Acme individuals will set the system up in an area designated by the SDTS personnel. Areas not to be "Flashed" will be provided by the SDTS personnel and the Acme team will mask those areas with the curtains provided and the lead-foil masking in roughly 10 minutes. After powering up the Flash Ray device and connecting the portable PC, the demonstration team will "flash" the first designated target 10'X10' section and proceed to reset the Flash Ray device until the SDTS designated inspection area has been covered in total. When the Flash process is complete, SDTS personnel will don the AR goggles and pinpoint where corrosion indications are resident in the inspection area. SDTS personnel can use other forms of NDI or other methods to validate the X-Ray Vision results and document the data.

- a. **How many days are in-port test periods?** 1 day
- b. **Does testing require at-sea test periods?** Preferably Yes. 1 day.
- c. **Does the solution have Ship provided Communication (internal/external) (e.g., UHF, VHF, etc.) requirements during testing?** No.