SAND2023-10878PE

WARHEAD CONFIRMATION

TECHNICAL SUPPORT FOR FUTURE AND CURRENT ARMS CONTROL EFFORTS

TRUSTED RADIATION IDENTIFICATION SYSTEM (TRIS)

3G TRIS

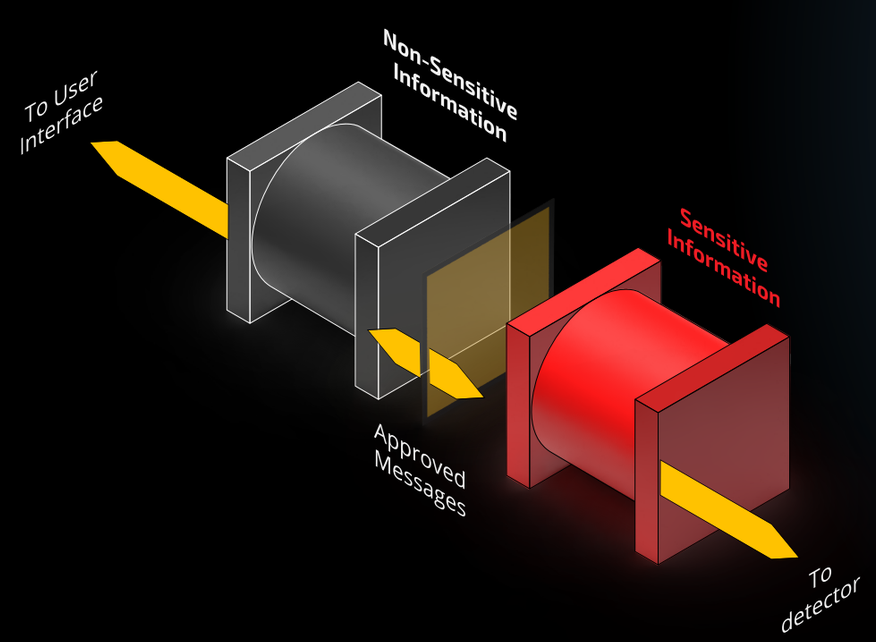
The Challenge

A major technical challenge of warhead confirmation is to provide confidence in the authenticity of Treaty Accountable Items (TAIs)—such as nuclear warhead components—while simultaneously protecting each party's sensitive information.

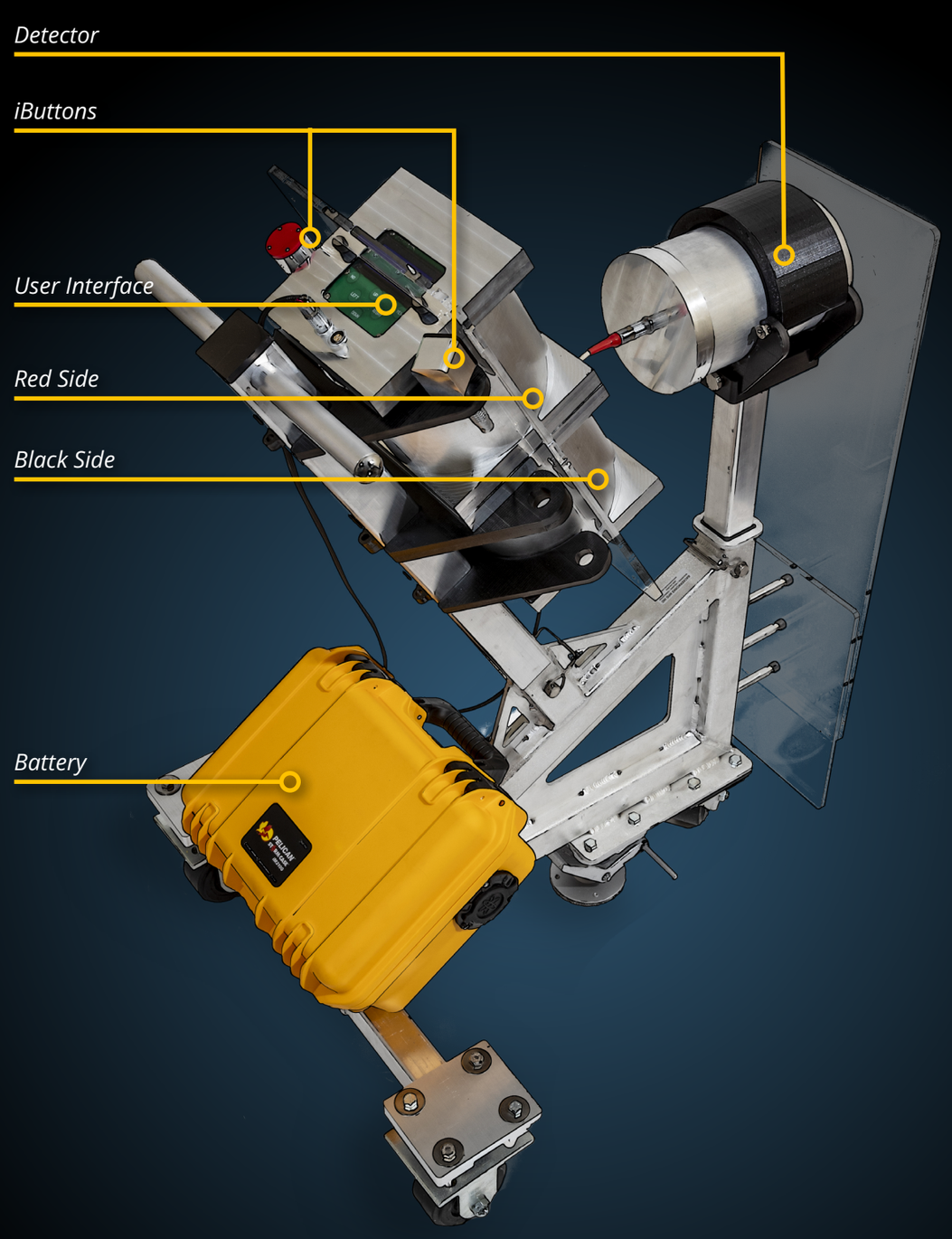
The Solution

Sandia's Third-Generation Trusted Radiation Identification System (3G TRIS) addresses this challenge via a radiation detector integrated into a special "trusted" data processing and encryption architecture comprised of red and black processors separated into two different tamper indicating enclosures (TIE).

"Red-Black" Trusted Processor Concept



3G-TRIS Assembly

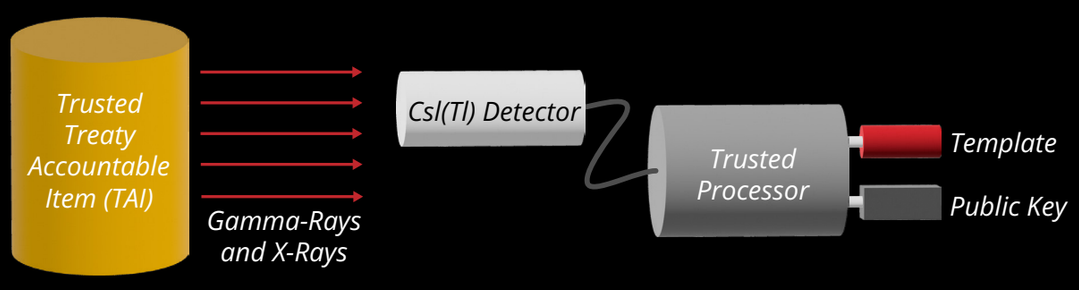


Technology Description

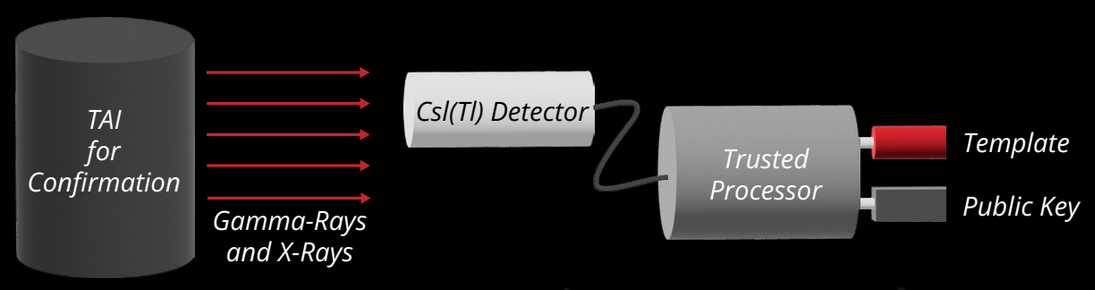
3G TRIS uses gamma radiation spectrum template measurements to initialize TAIs into an arms control regime and to maintain continuity of knowledge during storage.

Using data authentication and information barrier technologies, 3G TRIS can provide strong assurance to inspectors that a TAI is present without revealing sensitive information about its design or construction; the result is a simple "yes /no" confirmation.

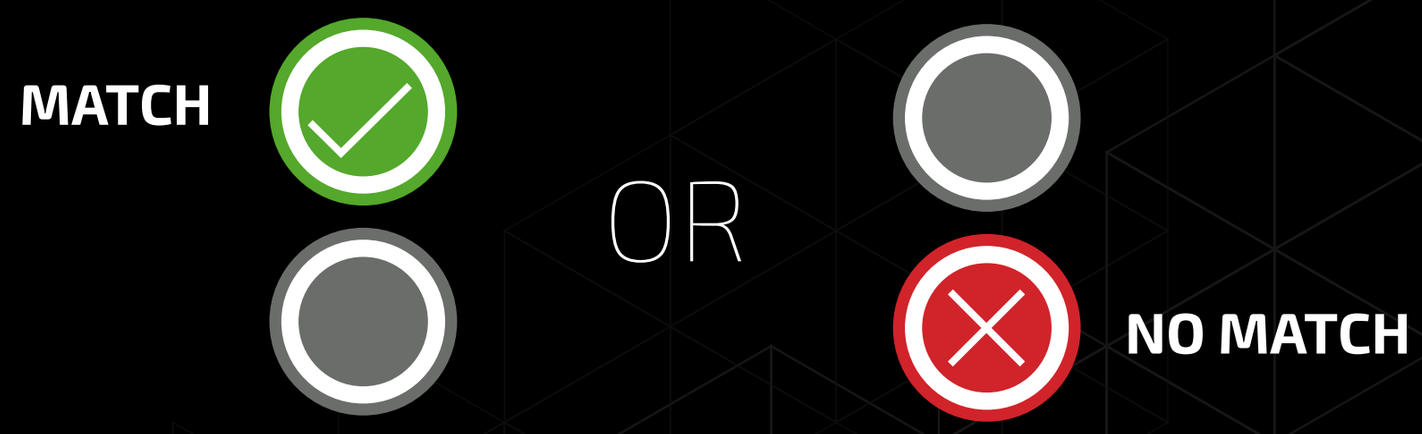
Create a template from a trusted item



System compares template to other Treaty Accountable Items



Information barrier response to question: "does the declared item match the template?"



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