


Building Sentry One Specification Review Sheet



AREAS OF DISCUSSION	NOTES	BUILDING SENTRY ONE (BSO) BENEFITS
Overall Chemical Detection System	Both systems create a network and communicate to each of the detectors and operate on a 24/7/365 basis and in real-time. Both systems utilize computers and software to process the detection data. Both systems can communicate to outside sources if desired. Both systems use graphics to demonstrate current system operation.	The BSO creates an "autonomous network" that operates outside the existing facility network thus making it virtually impossible to hack into from the outside which adds a high level of security and is very robust with little chance of external intrusion. All sensors are independently and direct connected to the BSO via CAT 5/6 cabling if the sensors are less than 100 meters from the main BSO cabinet and by Fiber Optic cabling if over 100 meters. In addition, the BSO has the ability to interface directly with any existing Building Management System (BMS), Command and Control platform or Operation Center in real time as well as having the ability to automatically and directly start/stop other devices such as NBC filtration, shut dampers, notify first responders and the like instead of <u>just alarming</u> (1.12.). Another advantageous attribute of the BSO system is that every detector is modular and can be adapted to any installation based on the individual threat and engineered need - example: it may not be necessary to install radiological detectors at every place a chemical detector is desired. Having a modular infrastructure allows for infinite installation possibilities and allows for a value engineered solution.
	Detection type of current specification	The BSO does not utilize any form of Ion Mobility Spectrometry (IMS) which is a technology prone to high false positive alarm rates. Additionally, these IMS detectors utilize an internal sample air pump that have an 8,000 hour life span (less than 1 year). The BSO also does not utilize Semiconductor technology with a 3 year lifespan for detection (2.2.2 b,e,h).
BSO Detection Solution	TIC Detector Module	The BSO Toxic Industrial Chemical (TIC) detector module does not have a false alarm potential because it utilizes a "double detection engine array" which is built using 2 identical Electro Chemical detection engines which makes it virtually impossible to experience false positive alarms because both engines must report an event at the same time to trigger an alarm. Due to the modular design of the TIC detector, it can be mounted up to 8 meters away with (2) 1/4" sample air tubes run to the detection space - this allows for installations without having detector boxes visible to people within the facility. The TIC module has a 48 month lifespan and requires only a refurbishment instead of full replacement like the other technology which saves money. To date, installed BSO's have operated in excess of 2 MILLION aggregated instrument hours without even 1 false alarm. The only maintenance for the TIC detector is the replacement of 2 "external" sample air filters which takes less than 5 minutes to replace and the BSO will notify you when the filters need replacement. There are also no additional consumables.
BSO Detection Solution	CWA Detector Module	The BSO Chemical Warfare Agent (CWA) detector module utilizes a proven Metal Oxide Intelligent Nano Array Sensor (iNAS) technology. The CWA module is currently being utilized by programs within the US Military, Department Of Defense and US Department of Homeland Security. Due to the modular design of the CWA detector, it can also be mounted up to 8 meters away with (1) 1/4" sample air tube run to the detection space - this allows for installations without having detector boxes visible to people within the facility. The CWA module is designed for 24/7/365 continuous use with a 4-5 year life cycle and requires only a refurbishment instead of full replacement like the other technology which saves money. The only maintenance is the replacement of an 1 "external" sample air filter which takes less than 5 minutes to replace and the BSO will notify you when the filter needs replacement. There are also no additional consumables.

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BSO Detection Solution	RAD Detector Module	It is not clear what type of technology is being used for radiological detection in the original specification as it is not stated (2.2.5 a., i.) but it appears to be a simple gross gamma count detector. The BSO Spectroscopic Radiological Area Detector Module not only detects in real-time but also has the ability to identify the isotope. The module utilizes a 3" Sodium Iodide (NaI) scintillator coupled with patented Quadratic Compression (QCC) and time-slicing and pattern-recognition techniques. This allows the detector to identify isotope-specific issues and total dose rate with the capability to identify Special Nuclear Material (SNM) as well. The detector has the capability for detection of multiple radionuclides concurrently within one second in real time at dose rates well below 1 µRem/hr and has a user extensible nuclide library of over 100 isotopes. The BSO also has multi-unit installation capability due to the autonomous PLC backbone and produces a detection report in ANSI N42.42 (Homeland Security) compliant format after a detection. Another advantageous capability of this detector is that it self-calibrates for background NORM and signal drift and utilizes calibration stabilization.
Detected Threats	Chemicals and Radiological Isotopes	Reviewing the lists of detected chemicals in the current specification, the BSO using both TIC and CWA modules detect a wider range of chemicals and weapon agents such as Phosgene which is a deadly agent and has been used to kill humans in the past. Please see a detailed list of TIC's, CWA's and Radiological Isotopes at the end of this review. The BSO has the ability to not only detect but also identify the over 100 isotopes listed.
PLC Autonomous Backbone & Network		Both systems utilize computers and software. The primary advantage of the BSO Autonomous Backbone and Network is not only that it is virtually unhackable but it is built with Industry Leading Allen Bradley components. These components are "not" proprietary and can be purchased by anyone. The COTS (Common Off The Shelf) design of the BSO ensures that if there is ever a problem with any of the components, they can be procured without having to contact the detector manufacturing company. Additionally, this network is comprised of equipment that is used in almost all SCADA platforms and can be easily added to almost any existing digital controls platform.
US Department of Homeland Security Designated Qualified Anti-Terrorist Technology		The BPSI Building Sentry One Solution was granted the US Department of Homeland Security SAFETY Act of 2002 Designation because of the exemplary performance of the system. This designation took roughly 2 years to complete through the US Department of Homeland Security (DHS) and as a result, the BSO is on a list of recommended products by the DHS. This is a very difficult performance based certificate to obtain and we do not believe the technology in the current specification has such a prestigious validation.
Overall Advantage of the BSO System		BPSI's Sentry One active CBRN detection and identification system is the first US Department of Homeland Security SAFETY Act Designated "next generation" solution which reliably detects, identifies, automatically activates predetermined mitigation protocols, and relays real time data to first responders (or anywhere) to expedite rescue and recovery. Unlike other companies who attempt to use laboratory equipment in the real-world environments, the Sentry One family of products were engineered from the ground up using a blank slate with particular focus on 1- no false alarms, 2- low cost of ownership and 3- very low maintenance needs. The modular construction and high performance of the equipment are two of the leading reasons why the BPSI Sentry One system is becoming the choice of security consultants and engineers and fast becoming the detection system of choice. We believe the BSO will outperform the current specification to a high degree and the end user will be very satisfied in the equipment supplied.

BSO SPECIFICATION

Chemical Weapon Agents (CWA):

Lewisite	Mustard
Phosgene	Sarin
Tabun	VX
Cyanogen Chloride	Hydrogen Cyanide

Toxic Industrial Agent (TIC):

Acetone	Acetylene
Acrolein *	Acrylonitrile *
Ammonia	Arsine
Bromine	Carbon Monoxide
Chlorine	Chlorine Dioxide
Chlorine Trifluoride	Cyanogen Chloride
Diborane	Ethane
Ethylene	Ethylene Oxide *
Fluorine	Formaldehyde *
Germane	Hydrogen
Hydrogen Bromide	Hydrogen Chloride
Hydrogen Cyanide	Hydrogen Fluoride
Hydrogen Sulfide	Iodine
Methanol	Nitrogen Dioxide
Nitrogen Trifluoride	Nitric Oxide
Ozone	Phosphine
Silene	Sulfur Dioxide
Toluene	

BSO RADIOLOGICAL ISOTOPE LIBRARY

Default:

Co60 Ga67 Tc99m Cs137 Ir192m Ra226 U235 U238
Am241

Database:

C11 N13 F18 Na22 Na24 K40 K42 K43 Sc46 V48 Cr51
Mn52 Mn54 Fe52 Fe59 Co55 Co57 Co58 Co60 Cu64
Cu67 Zn65 Zn69m Ga67 Ga72 As72 As74 As76 Se75 Br77
Rb81 Rb84 Sr85 Sr89 Y86 Y88 Mo99 Tc99m Pd103 Cd109
In111 In113 Sb122 Sb124 Sb125 I123 I124 I125 I129 I130
I131 I133 Xe133 Cs134 Cs137 Ba133 Ba137 Ce144 Sm153
Eu152 Eu155 Yb169 Ir192 Au198 Au199 Hg197 Hg203
Tl201 Tl204 Tl208 Pb203 Pb210 Pb212 Pb214 Bi207 Bi212
Bi214 Ra224 Ra226 Ac228 Th232 Th234 Pa234 U233
U235 U238 Np237 Pu238 Pu239 Am241

ANSI N42.34 Isotopes:

K40 Co57 Co60 Ga67 Tc99m I125 I131 Ba133 Cs137 Ir192
Tl201 Ra226 Th232 U233 U235 U238 Pu239 Am241

Industrial isotopes:

Co57 Co60 Ba133 Ba133s Cs137 Ir192 Tl204 Am241
Th232

Medical isotopes:

F18 Cr51 Ga67 Se75 Sr89 Mo99 Tc99m Pd103 In111 I123
I125 I131 Xe133 Sm153 Tl201

SNMs:

U233 U235 Np237 Pu238 Pu239