CONFIDENTIAL AND PROPRIETARY

TECHNOLOGY MEMORANDUM

DOD & CIVIL AVIATION AND PUBLIC WORKS INFRASTRUCTURE INTEGRATED SECURITY

Global Center for Preparedness and Resilience, Inc.
and
Great Plains Biosciences Group, LLC

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TECHNOLOGY MEMORANDUM

DOD & CIVIL AVIATION AND PUBLIC WORKS INFRASTRUCTURE INTEGRATED SECURITY

Integrated Life-Safety, Storm and EMP- Safe Resilient & Efficient Power, Data, Public Works, Public Safety, Commercial & National Defense Aviation Infrastructure Hardening Programs

Global Ctr for Pre'dness & Resilience
1900 S Academy Melbourne FL32901
www.globalcenter.com
info@globalcenter.com

Great Plains Biosciences Group
725 N Main St Newton KS 67114
www.gpbiosciences.com
info@gpbioswciences.com

Global Center for Preparedness and Resilience, Inc.
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PROGRAMS' VALUE PROPOSITION SUMMARY

HARDENED AIRCRAFT HANGERS AND AIRFIELD FACILITIES

HARDENED AND DISPERSED AIRFIELD FUEL TANK FARMS

HARDENED & WATERPROOFED INTERNET/DATA FIBER HUBS

HARDENED MIROGRID MWe GENERATION & DISTRIBUTION SYSTEMS

HARDENED PUBLIC WORKS UTILITIES INFRASTRUCTURE

Our *SYSTEMS APPROACH PROGRAM achieves FEMA 361, ICC-500 and NSSA Standards incorporating steel-reinforced insulated thin - shell concrete structures providing near absolute protection from:*

- ✓ **EXTREME WIND EXCEEDING 250 MPH,**
- ✓ **EF-5 TORNADOS,**
- ✓ **CAT 5 HURRICANES,**
- ✓ **FIRES,**
- ✓ **FLOODS and RISING SEA LEVEL(S)**
- ✓ **EARTHQUAKES,**
- ✓ **GEOMAGNETIC STORM(S),**
- ✓ **CORONAL MASS EJECTIONS/ "SOLAR FLARES",**
- ✓ **SUDDEN IONOSPHERIC DISTURBANCES,**
- ✓ **ELECTROMAGNETIC PULSE/ NUCLEAR ELECTROMAGNETIC PULSE,**
- ✓ **HIGH ALTITUDE ELECTROMAGNETIC PULSE AND**
- ✓ **INTENTIONAL ELECTROMAGNETIC INTERFERENCE THREATS.**

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Key Team: Dr. Clifford Bragdon, PhD, President and Founding Member and Director of GLOBAL CENTER FOR PREPAREDNESS AND RESILIENCE

Frank Parker, CTO and Founding Member and Director GLOBAL CENTER FOR PREPAREDNESS AND RESILIENCE also CTO & Founding Member and Director of Great Plains Biosciences Group, LLC

Rosalind A. Gatewood, VP and Founding Member and Director GLOBAL CENTER FOR PREPAREDNESS AND RESILIENCE

M. Lisa Shasteen, Esq. VP, Cybersecurity & Privacy, Member and Director GLOBAL CENTER FOR PREPAREDNESS AND RESILIENCE

Rick Crandall, AIA, President, Crandall Design Group Architects

- on the Unique Features of Monolithic Domes
- https://www.monolithic.org/commercial/monolithic-dome-airplane-hangars-and-the-invention-of-the-hangar-door

DOD & CIVIL AVIATION AND PUBLIC WORKS
INFRASTRUCTURE INTEGRATED SECURITY

1.0 NOAA Technical Memorandum NWS TPC-5 reports that since 1851, five Major Hurricanes impact onto the Continental US every three years, averaging one Category 3, 4 or 5 Hurricane every 7.2 months (0.6 Year) per Storm event.

1.1 Hurricane Michael hit the Florida Panhandle on 10 October 2018, destroying Tyndall AFB and causing Billions of Dollars of damage in Florida, Georgia and the Carolinas.

1.2 The 2014 Quadrennial Homeland Security Review:

Combating terrorism remains DHS's primary mission, but recent disasters have led DHS to adopt a risk-based approach to significant threats from both man-made and natural disasters which is identified in its 18 June 2014 second quadrennial report.

1.3 The 104-page report considers disastrous weather events a growing challenge, citing Hurricane Sandy, which killed 117 people and knocked out power to 8.5 million residents.

1.4 A changing climate will only increase the risk of more natural disasters, and such risk, combined with an aging infrastructure and population increases in vulnerable areas, sets the stage for a catastrophe.

1.5 DHS must improve technology transfer to ensure that new infrastructure is built to be more secure and resilient, and current infrastructure is well protected.

1.6 Preparedness and resilience initiatives are positive investments.

2.0 Storm and EMP - Safe Power, Data & Public Works Infrastructure

2.1 Our **Hardened Personnel Safety and Security Protocol (HPSSP)** and **Hardened Utilities Infrastructure Protocol (HUIP)** are SYSTEMS APPROACH SOLUTIONS for the protection of Life and Property. Steel-reinforced thin shell insulated concrete structures are included among the very best current design and engineering practice (Best Practice) for ***Community Public Safety sheltering*** purposes.

2.2 These systems to provide cost-effective citizen, asset and infrastructure protection and security functions for near-absolute protection from Direct Weapons Fire, Extreme Wind conditions exceeding 250 MPH which include EF-5 Tornados and Cat 5 Hurricanes, Fires, Floods and Earthquakes.

2.3 Our design and construction systems achieve Top-rating Life-cycle Cost performance factor ratings with lower construction and outyear maintenance costs vs comparable permanent construction facilities with equivalent resilient attributes and benefits.

3.0 The US Aviation Transportation Sector's unique vulnerability

3.1 The Aviation Sector of our National Transportation Infrastructure System is uniquely vulnerable to natural and manmade Aggressor Threat Risks due to highly concentrated physical plant features which include concentrated high value aircraft and their ground support systems, large volumes of highly flammable liquid fuels and dependence on operationally robust and critically precise utilities and digital systems.

3.2 Today, Multiple Aggressor and Swarming Drone attack platforms can deliver kinetic munitions and electronic payloads weighing upwards pf 100 kg., over extended distances, sufficient to detonate/ignite Aviation Fuel Tank Farms and disable power and communication systems. This program focuses on Aggressor Drone intercept/kill systems and hardening facilities to protect against EMP/IEMI threats.

3.3 It is self-evident that the US Aviation Transportation System is vulnerable to the evolving impact of Aggressor Drone-borne munition, EMP/IEMI and cybersecurity threats. The Global Center is focused on providing an ***Integrated Systems Approach*** to Aviation Infrastructure Risks Mitigation which can achieve significantly improved levels of protection for both Civilian and DOD Aviation Operations.

3.4 Our program incorporates site surveys and sophisticated multi- Dimensional modeling to determine the candidate Airfield's Vulnerability/Risk profiles, the development of appropriate Risk Mitigation Strategies, and the Engineering and Management of Systems' Hardening Construction to support a resilient national aviation logistical system.

4.0 High Threat Aviation Infrastructure Risks include:

a. Hurricane/Tornado Winds & Floods; Rising Sea Level Storms' Surge inundations
b. Electromagnetic Weapon, Geomagnetic Storm, Coronal Mass Ejection events
c. Aggressor Vehicle, Marine and Aircraft-borne and UAV Kinetic and Electronic Weapons; UAV Swarms
    - Personnel and Facilities Protection
    - Civilian Aviation Infrastructure
    - National Defense, Gov't Agency & Public Safety Aviation Infrastructure
d. Airfield Fuel Tank Farms with Large Volumes of highly flammable Aviation Fuels
e. Airfield and Administrative Services' Power, Data & Water Utilities' vulnerability
f. ATC & "Ticketing" dark fiber Hardware Power, Com/Data Systems' vulnerability

4.1 Hardened Aircraft Hanger and Critical Field Facilities

4.1.1 Our program's steel-reinforced thin shell concrete structures are included among the very best current design and engineering practice (Best Practice) for ***Community Public Safety sheltering*** purposes to provide cost-effective

citizen, asset and infrastructure protection and security functions for near-absolute protection from Direct Weapons Fire, Extreme Wind conditions exceeding 250 MPH which include EF-5 Tornados and Cat 5 Hurricanes, Fires, Floods and Earthquakes.

4.1.2 Our program incorporates Monolithic Dome's Patented steel-reinforced thin shell concrete structure design which are tornado safe, firesafe and earthquake safe—providing "near-absolute" protection, certified to withstand winds states of 300 mph, creating the perfect shelter for personnel, high value assets and all types of aircraft.https://www.monolithic.org/commercial/monolithic-dome-airplane-hangars-and-the-invention-of-the-hangar-door.

4.1.3 Hangar doors are curvilinear concrete construction which rotate either internally or externally of their hanger to maintain the aircraft hangar's structural integrity; US Patent 7013607 Monolithic Unitary contoured laterally moveable access door.

4.1.4 This technology provides safety and cost-effectiveness. The Monolithic Dome steel-reinforced thin shell concrete Aircraft Hangar is extremely energy efficient; this construction method reduces heating and cooling energy costs by up to 75%.

4.1.5 Metal buildings keep the sun and rain off aircraft but do not provide thermal protection.

4.1.6 The steel-reinforced thin shell concrete structure's superior insulation and thermal s1tability attributes maintains an aircraft at nearly constant, reasonable temperatures – reducing the maintenance and extending the life of advanced electronics and avionics systems.

4.2 In addition to being Storm, Fire, Flood and Earthquake-proof, this technology repels direct rifle fire, grenade launchers and mortars. In an unsolicited email sent to Monolithic in January 2008, an army helicopter pilot reported that there was a concrete dome at an old Iraqi military site that was being used as a helicopter gunnery range.

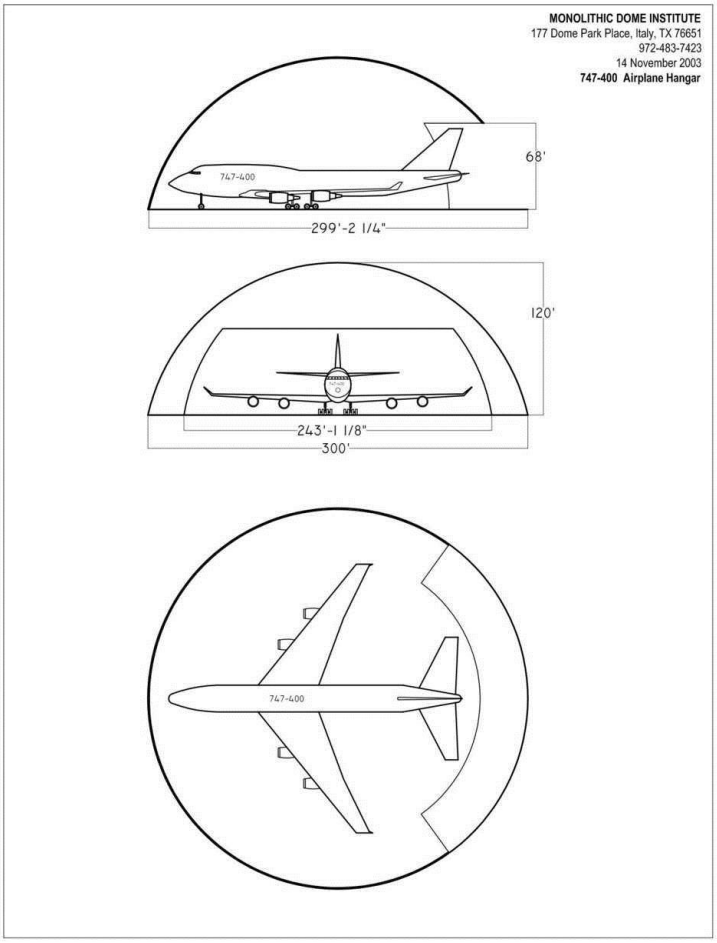
> He said, "It is definitely a concrete dome with rebar reinforcement like your own and we had teams shooting rockets at it for months before someone finally was able to punch a hole in it.
>
> Even direct hits would often glance off of it, it was pretty impressive."

4.2.1 The Basra Palace's Monolithic Domes withstood the Coalition Forces' bombs, requiring direct hits in the structures' crown.

4.2.2 Were Tyndall AFB's aircraft protected by these hanger systems, all would have survived Hurricane Michael's winds and floods.

4.3 This technology can protect America's Military and Commercial Aircraft fleets, cost- effectively securing and protecting planes within. USAF F-35s easily fit in a small Monolithic Dome; it is resistant to more than hurricanes and tornadoes.

4.4 Graphic – Monolithic Dome Hardened Hanger for Boeing 767 Aircraft



4.5 Huge Monolithic Dome hangars are capable of protecting even the largest jets including the Airbus A380, Boeing 747 and the Air Force C5 cargo jet; these hangars can be constructed with clear-span of up to 1,000 feet, capable of securing today's largest flying machines.

5.0 Key Monolithic Dome System Attributes

Rick Crandall of Crandall Design Group, Mesa, AZ said, "More and more people are discovering that there are advantages to a Monolithic Dome — unique features — simply not available in traditional architecture."

5.2.1 Near-Absolute Protection From Tornadoes and Hurricanes – Winds, 300 MPH and more, have little effect on the basic dome shape and because the dome is Monolithic, it will not come apart in pieces.

5.2.2 Highly Secure - The inherent strength of a Monolithic Dome's concrete construction makes exterior assault, bombs, rockets and bullets nearly impossible.

5.2.3 Fireproof – Fire Events on record show that the concrete shell System is impervious to fire and will not spread a fire or collapse from heat.

5.2.4 Seismic Resistant - Its symmetrical shape and strength give the System an ability to survive earthquakes.

5.2.5 Long-span Column, Free Interiors - Long spans of up to 880 feet have already been calculated, with possibilities of extending even further.

5.2.6 Lower Initial Costs - Typically, Monolithic Dome System construction costs are lower than conventional construction costs.

5.2.7 Energy Efficiency, Long Term Savings - The System's inherent thermal mass and thermo-siphoning out of the ground, as well as the wall penetration resistance of the insulation produce energy savings of up to 50% over current building types.

5.2.8 Low Maintenance, Long Life, No Decay - A one-piece, concrete building can last for centuries without degradation, cracking or material creep.

5.3 Ancillary Monolithic Dome System Attributes

5.3.1 Buried Building, Below Grade - With the Airform's resistance to moisture penetration and the concrete's resistance to compression, the Monolithic Dome lends itself to below grade construction.

5.3.2 Underwater - As they can be built underground, Monolithic Domes also can be built underwater.

5.3.3 Alternate Atmosphere - Monolithic Domes can be pressurized to vary air pressure and atmosphere, and act as biological containment vessels.

5.3.4 Interior Hanging Strength - A Monolithic Dome's ceiling and walls can safely tolerate various hanging features, such as balconies, mezzanines, walkways, press boxes, galleries, score boards, audio and video housing, etc.

5.3.5 Remote Site, Materials Availability - Simple construction methods and locally available materials make dome construction in remote areas relatively easy and fast. Monolithic Domes have been built worldwide, from arid deserts to the Arctic Circle.

5.3.6 Termite Proof, Vermin Resistant – In different parts of the world, insect and vermin infestations can shorten a wooden building's life by a decade. But a concrete shell structure is impervious to this problem.

5.4 Key Attributes of the Monolithic Dome Aircraft Hanger System

5.4.1 The Monolithic Dome System achieves a natural internal and external water barrier.

5.4.2 The front hanger door can be bolted in place in minutes for a tornado/hurricane and a portable (inflatable) coffer dam installed in 3 hours across the hanger door opening to prevent storm surge intrusion; this technology already exists and can be adapted for hanger door flooding up to six feet (6') high easily, possibly higher.

5.4.3 This inflatable coffer dam is manufactured of thick hard rubber folded like a continuous life raft material and installed in a 50' long by 30" deep trench in the folded position.

5.4.4 A system of thick steel "runover" plates covers the trench while the inflatable coffer dam resides in its stored position in the trench.

5.4.5 Standard tire inflation equipment can inflate the coffer dam system within an hour to full pressure after the ends have been clamped to the dome walls.

5.4.6 Actual inflation and complete erection time may be closer to two hours from start, rather than three hours, depending on several variables.

5.4.7 The length of the dam is as important as the height as beyond 50' width requires extra steps, restraints and storage design.

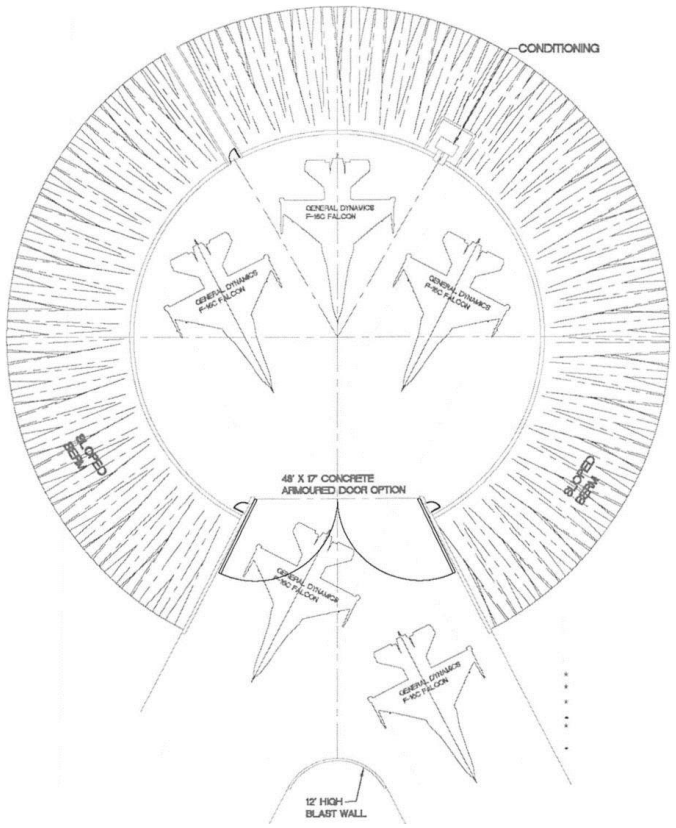
5.4.8 A 50' dam and separate door will accommodate several strike aircraft types with wingspans of 43' width or less including 5 types already in use by the USAF.

5.4.9 This anti-flood device along with its integrated "trench" configuration and Nuclear protection doors will complement the Monolithic Dome System capabilities for high "impact", "thermal shock", "sustained high winds" and "stormwaters flooding" protection.

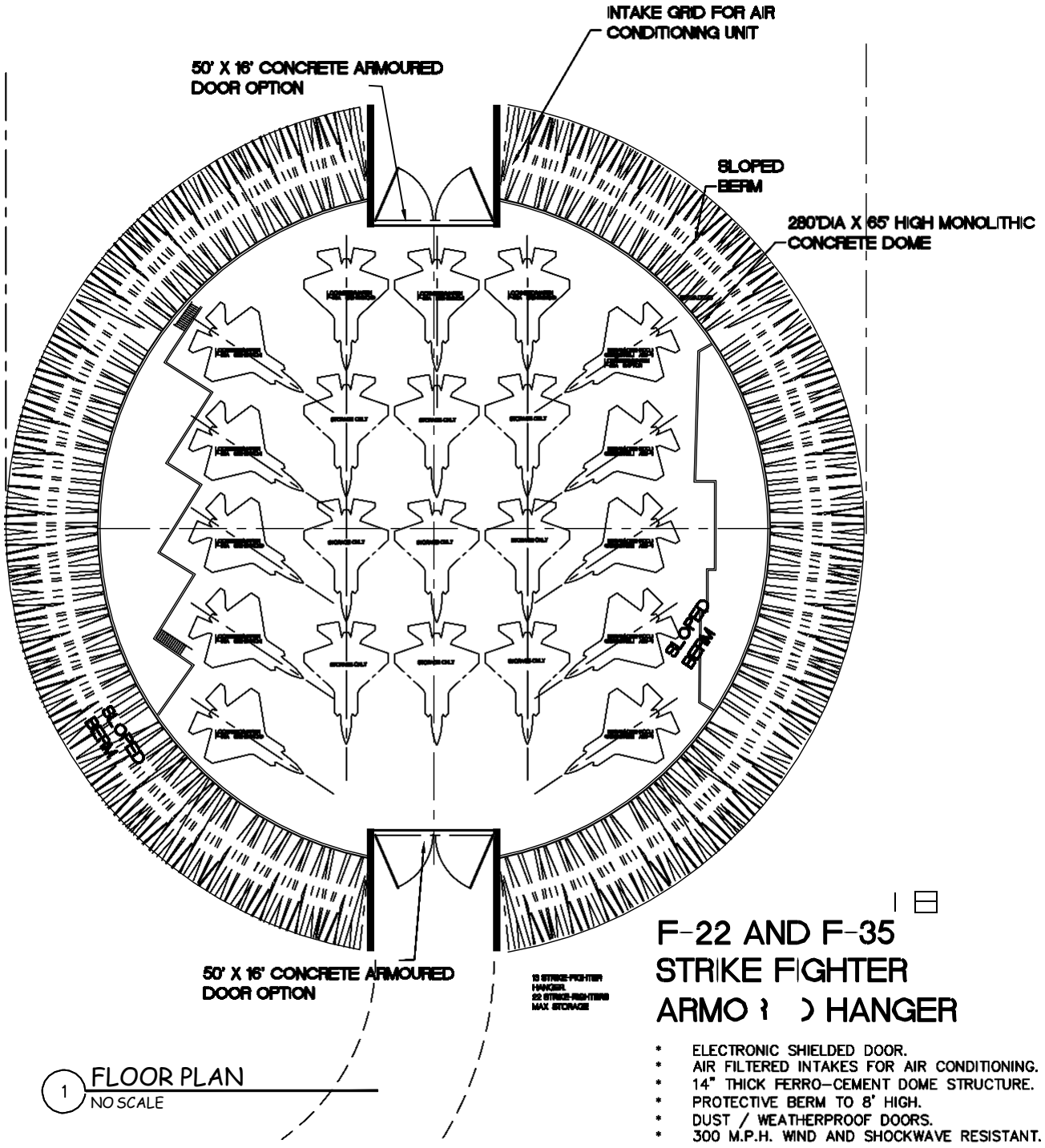
5.5 "Hot Launch" from Hanger capability

5.5.1 When configured with engine exhaust ports above the flood line, raised hanger offices, ready rooms and shops at the structures' upper levels, the USAF has a "Hot Launch" capability that will allow aircraft launch immediately from the hanger interior; these "Hot Launch" flight line personnel will need to employ operating procedures similar to naval carrier flight deck operations' safety and operational practices.

5.5.2 Graphic - Strike Fighter Armored Hanger, Plan View



5.5.3 Graphic – F22 and F35 Strike Fighter Armored Hanger, Plan View



6.0 Hardening & Dispersal of Large Airfield Jet Fuel Tank Farms

6.1 Hardening, reducing on-field volumes and dispersing airfields' Aviation Fuel Tank Farm storage and delivery systems will reduce weaponized drones attack and other threats as the smaller, distributed targets are of an individually lower value, are more difficult to attack and provide system redundancy.

6.2 Had Japan's 7 December 1941 attack on the US Pacific Fleet at Pearl Harbor, Hawaiian Islands also included their destruction of our naval and aviation fuel tank farms, America's ability to have successfully prevailed against the Japanese during 1942's Coral Sea, Midway and Solomon Islands' campaigns could have been significantly impaired.

6.3 The alleged single sniper who fired onto a crowd in Las Vegas, NV killing 58 and injuring 851 during the 1 October 2017 Route 91 Harvest Music Festival shot into the McCarran Airfield Fuel Storage Tank Farm.

6.3.1 McCarran's fuel tanks were hit 8 times but fortunately failed to explode; had McCarran's Fuel Tank Farm burned, the sniper's attack on the festival crowd would have been significantly deadlier and more dramatic, and McCarran International Airport's operations would have been significantly disrupted.

6.3.2 Our Aviation Infrastructure Security Platform incorporates the hardening, dispersal and significant reduction of On-Site Airfield Tank Farm fuel volumes to minimum "day tank" capacity requirements, replenished by fuel transfer from off-site, multiple secure supply small, redundant "day-tank" fuel farms and transfer pumping stations; and redundant dedicated airfield fueling pipelines.

6.3.3 Elimination of Fuel Delivery Tankers to Airfield Site reduces Aggressors' opportunities to bring large vehicle-borne munitions onto Airfield (re: USMC barracks, Beirut Lebanon 23 October 1983, Khobar Towers, Saudi Arabia, 25 June 1996, Alfred P. Murrah Federal Building, Oklahoma City, 19 April, 1995…)

7.0 Power and Data Integrity Threats include:

7.1 Chinese, Iranian, North Korean and Russian ICBM-delivered EMP threats to the US National Grid is fully appreciated by DHS et al, but local high value power and communication systems are vulnerable to targeted attacks as a stand-alone as well as combined with a Grid-level attack.

7.1.1 Other vulnerable targets include critical public safety, homeland security and national defense installations, public works, medical, industrial, communications and data centers.

7.2 Electromagnetic energy creates ('induces') energy potential (voltage) in equipment even when it is not plugged in.

7.2.1 That energy could very easily exceed tolerances of the components of the equipment – something as low as a 30V inducement could irreparably damage electronics.

7.2.2 Additionally, vulnerability of electronic memory components is at risk; should the electronic memory component physically survive the EMP transient overvoltage event, there remains the strong probability that the critical programming codes it contains may be sufficiently corrupted to render the system inoperable.

7.3 Electromagnetic Threat Categories include:

SID	Sudden Ionospheric Disturbance
GMS	Geomagnetic Storms
CME	Coronal Mass Ejections/ “Solar Flares”
EMP/NEMP	Electromagnetic Pulse / Nuclear Electromagnetic Pulse
HEMP	High Altitude Electromagnetic Pulse
IEMI	Intentional Electromagnetic Interference

7.3.1 Electromagnetic Pulse/High Altitude Electromagnetic Pulse Threats: Electromagnetic Pulse (EMP) or a Coronal Mass Ejection (CME) from our sun produce high powered electromagnetic ‘rays’ that are very damaging to electrical and electronics-based equipment.

7.3.2 EMPs and CME events are capable of catastrophic levels of destruction.

Electromagnetic Pulses and Geomagnetic Storms can alter Earth's magnetic field, triggering destructive surging currents in power and microelectronic circuits. EMP/GMS can destroy or immobilize power plants, distribution grids, water and wastewater pumps, communications and data centers, machinery, aircraft and vehicles.

7.3.3. On July 9, 1962, the DOD detonated a 1.4-megaton H-bomb over the Pacific at an altitude of 250 miles. Power circuits were shorted out in Oahu, Hawaii, 900 miles away.

7.3.4 The March 9, 1989 "coronal mass ejection" triggered a geomagnetic storm that knocked out power for 6 million people in Canada and the USA for at least nine hours.

7.4 Types of military EMP include:

7.4.1 Nuclear electromagnetic pulse (NEMP), resulting from a nuclear explosion. This is also known as High altitude nuclear EMP (HEMP), which produces a pulse of a much larger amplitude and different characteristics due to interactions with the Earth's magnetic field.

7.4.2 NEMP/HEMP from a nuclear detonation can still be higher than 100,000 volts hundreds of miles away.

7.4.3 IEMI - Intentional Electromagnetic Interference

7.4.4 EMP events and IEMI attacks onto power and/or communication lines can have huge impact on systems, the effects varying from the very subtle – errors in data streams and microprocessor instruction operation through to system lockups, hard resets and even permanent damage which renders a system beyond repair.

7.4.5 IEMI differs from most other EM threats in that it typically occupies a narrow frequency band, contrasting with other threats such as lightning and HEMP (high-altitude EMP), which are very broadband in nature.

7.4.6 IEMI threats range from "Radio Shack" level to Military; low-cost hardware including modified microwave ovens, Radio Frequency guns or EM jammers that can be bought for a few hundred Dollars. While technically unsophisticated, such attacks could easily cause persistent disruption or damage without leaving an evidence of an attack.

7.4.7 A Diehl pulsar is an off-the-shelf "interference source" capable of emitting a 350MHz damped sine wave output and 120kV/m at 1m continuously for 30 minutes; provided with an appropriate antenna, it is capable of disruption or damage at a long distance.

7.4.8 High power military systems include the Boeing CHAMP missile and the Russian RANETS-E, which is capable of a 500MW output and range of 10 km.

7.4.9 Mobile attack platforms can vary from trucks with antennae to Drones and Missiles.

7.4.10 Additionally, an Aggressor's IEMI equipment can be extremely stealthy, especially if fixed equipment can be set in proximity to the targeted system – in a building across the street or even an adjoining room, potentially allowing an attack to go unnoticed for a long time, or possibly to not be noticed at all.

7.4.11 This emphasizes a very critical threat characteristic regarding IEMI protection – target access. Access is in terms of distance either from threat to target in radiated systems, or to incoming power and communications cables for injected conducted disturbances.

8.0 Fiber Data Systems Integrality and Data Security

8.1 Internet Infrastructure Sea Levels Rise Risks

8.2 National Geographic published an interactive map showing the results of 216 feet of sea level rise on the world's coastlines, reflecting the consequences of the melting of all of the world's terrestrial ice.

8.3 With Arctic temperatures at their highest in 44,000 years, ice cover has hit record lows and scientists report that sea level is rising 60% faster than anticipated. Just six feet of sea level rise would be enough to ruin South Florida and experts warn that we've already "baked in" approximately 70 feet of sea level rise.

8.4 In January 2015 the U.S. Army Corps of Engineers released the North Atlantic Coast Comprehensive Study (NACCS), a coastal storm risk management platform addressing the increasing risks resulting from the increased frequency and intensity of storm events and rising sea levels.

8.5 Thousands of miles of buried fiber optic cable may soon be inundated by rising seas, according to "Buried Internet infrastructure at risk as sea levels rise," University of Wisconsin-Madison, as reported in ScienceDaily, 16 July 2018.www.sciencedaily.com/releases/2018/07/180716141627.htm

8.6 **"**Thousands of miles of buried fiber optic cable in densely populated coastal regions of the United States may soon be inundated by rising seas, according to a new study by researchers at the University of Wisconsin-Madison and the University of Oregon.

8.7 "The study portrays critical communications infrastructure that could be submerged by rising seas in as soon as 15 years, according to the study's senior author, Paul Barford, a UW-Madison professor of computer science.

8.8 "Most of the damage that's going to be done in the next 100 years will be done sooner than later," says Barford, an authority on the "physical internet"

-- the buried fiber optic cables, data centers, traffic exchanges and termination points that are the nerve centers, arteries and hubs of the vast global information network.

8.9 "It suggests that by the year 2033 more than 4,000 miles of buried fiber optic conduit will be underwater and more than 1,100 traffic hubs will be surrounded by water.

8.10 "When it was built 20-25 years ago, no thought was given to climate change."

8.11 "Buried fiber optic cables are designed to be water-resistant, but unlike the marine cables that ferry data from continent to continent under the ocean, they are not waterproof. Many of the conduits at risk are already close to sea level and only a slight rise in ocean levels due to melting polar ice and thermal expansion as climate warms will be needed to expose buried fiber optic cables to sea water.

8.12 "The impact of mitigation such as sea walls, according to the study, are difficult to predict.

"The first instinct will be to harden the infrastructure," Barford says.

"But keeping the sea at bay is hard.

We can probably buy a little time, but in the long run it's just not going to be effective."

"This is a wake-up call.

We need to be thinking about how to address this issue."

9.0 Hardened Electrical Power Microgrid Systems and Data Centers

9.1 EMP/IEMI - proofing and physical facility security enhancements to Hardened Back-up Micro-Grid electrical power systems and Data Centers

9.2 Delta, British Airways, South West Airlines have recently experienced major operational disruptions due to computerized scheduling and ticketing system problems "supposedly not terrorist related"; Atlanta's Hartsfield-Jackson Airport suffered a major operational fubar event when a back-up power system failed at the regional Air Traffic Control Center (ATC).

9.3 We have enhanced the steel-reinforced thin shell concrete structure. The struts as a wave-guide and determines what frequency of electromagnetic radiation is rejected, attenuated or passed.

9.4 A hardened Faraday Cage achieves the most complete electromagnetic energy facility protection technology available.

9.5 This specially configured ferrocement reinforced concrete construction system, appropriately modified with close-space screening underlayment(s) provide a materials-efficient and cost-effective means for achieving CME, EMP, HEMP and IEMI threats protection for critical transportation, public safety, homeland security and national defense installations, water, wastewater and power public works, medical, industrial, dark fiber communications systems and data centers infrastructure.

10.0 Hardened Microgrid Systems

10.1 The U.S. Department of Energy's official definition of a microgrid is "a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid (and can) connect and disconnect from the grid to enable it to operate in both grid - connected or island-mode."

10.2 Smart Microgrids enable critical infrastructure – Military, Governmental, Medical, Manufacturing and Institutional facilities and Net-Zero and DC (direct current) Communities to efficiently provide onsite generation, and electrical distribution and management.

10.3 Smart Microgrids enhance the value of distributed renewable resources, especially solar and wind power generation systems, by providing a reliable localized electrical system that can disconnect from the central utility grid and operate independently for extended periods of time during an emergency.

10.4 Smart Microgrids can be "hardened" public works assets which can provide resilience measures protecting against system degradation or failure by geomagnetic storm (GMS), radio frequency weapon (RFW) or nuclear weapon-generated Electromagnetic Pulse (EMP) threats.

10.5 Radio frequency weapons are a non-nuclear EMP weapon capable of emitting a pulse similar to a nuclear E1 EMP, with less destructive power capability and short range, typically limited to ranges of less than one mile.

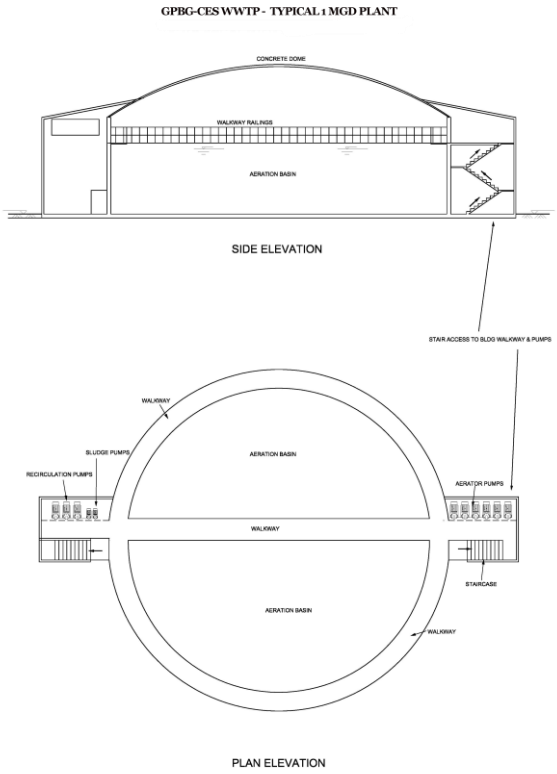
10.6 Storm-proofed Smart Microgrids configured as resilient installations with anti-GMS/EMP hardened features allow public safety, governmental, medical and institutional facilities' critical power and data infrastructure systems to maintain operations independent of the central utility grids' ability to continue to function.

11.0 Hardened Water and Wastewater Public Works Infrastructure

11.1 Our Hardened Utilities Infrastructure Protocol achieves system protection from Natural or Human Aggressor Threats enclosing and providing system capability to ride-through major Storm or Aggressor Threat events without service disruption.

11.2 Our Wastewater Treatment Plant (WWTP) design achieves system protection from natural or man-made threats and operates without fugitive odors, noise, bird/animal nuisance or disease vectors; the insulated building maintains the optimum biological process temperature control range.

11.3 Graphic – Monolithic Dome Hardened Wastewater Systems



11.4 This enclosed process basins and treatment works and on-site electrical power produced from WWTP biogas, solar and wind generators achieves energy self-sufficiency and the systems' capability to ride-through major storm events without contaminating the community from untreated sewage discharged from overtopped sewer plant tanks.

11.5 Years of droughts in the Western United States and Global fresh water shortages have made the re-use of wastewater an appropriate water resource; GPBG's enclosed systems support the development of wastewater reuse projects that are priced at nearly half of the cost to build, own and operate vs current state of the art systems.

11.6 Our enclosed treatment process systems achieve reuse quality effluents utilizing efficient and cost-effective technologies.

11.7 US-EPA and Metcalf & Eddy's text guidelines for US domestic sewage guidelines provide for roughly 100 GPD/person.

11.8 Influent strength BOD5 in the USA typically ranges from 200-250 mg/L.

11.9 These systems can be engineered to meet all effluent discharge water quality requirements including aquifer recharge quality specification.

11.10 The integrated, hardened wastewater treatment system assures uninterrupted achievement of effluent discharge quality requirements.

12.0 Summary

12.1 An Integrated Aviation Infrastructure Security Platform for the United States is not currently in place and is essential for the protection and well-being of our airport systems network, that includes air carrier based, military, general aviation and private sector general aviation fixed wing and rotary wing aircraft and their associated infrastructure.

12.2 As transportation mobility and logistics for the efficient modal movement of people, goods, resources and information by air, land, sea and space is fundamental to our economic and social well-being.

12.3 Air transportation is an essential modal element that must be protected in order to have a resilient system of movement that is safe, secure, healthy and sustainable.

12.4 We must be cognizant always of threats associated with environmental threats and advanced technology and delivery systems, combined with geo-political entities that may have ulterior motives.

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