



## **Multi Purpose Personal Safety System**



# Survival Capsule Team

Survival Capsule LLC is comprised of Aerospace Engineers and a Doctor of Oceanography and Tsunami research (Former member of NOAA).



**Julian Sharpe** - President (Bachelor of Technology)  
Aerospace stress engineer with 29 years of experience working in 8 different countries, working on rotary and fixed wing aircraft, satellites, launch vehicles and airships.



**Scott Hill** – Vice President (Bachelor of Science)  
Aerospace design and stress engineer with 14 years of experience working on rotary and fixed wing aircraft.



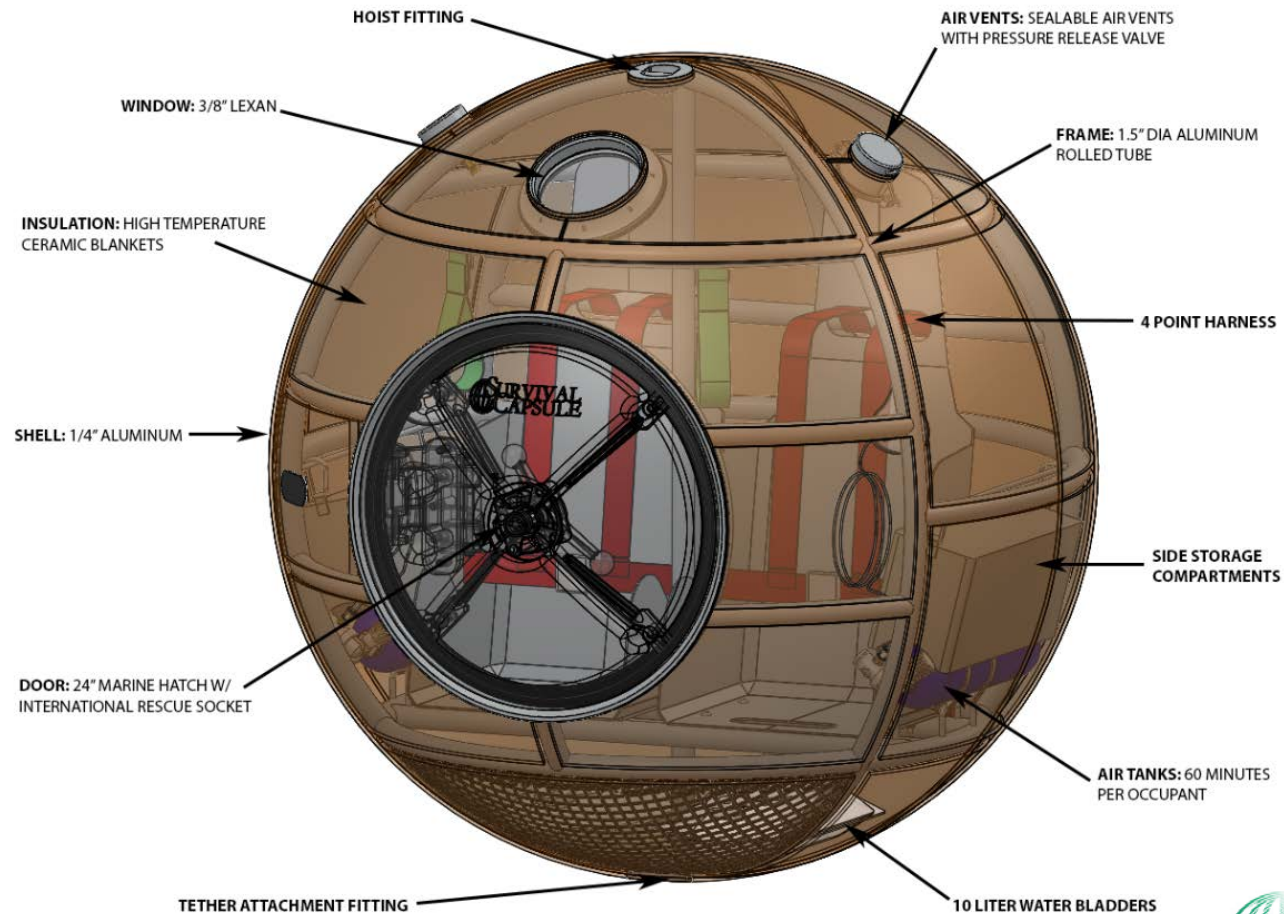
**Dr. Eddie Bernard** – Vice President of Research (Ph.D.)  
Affiliate Professor at the University of Washington and Scientist Emeritus for the National Oceanic and Atmospheric Administration's (NOAA) Pacific Marine Environmental Laboratory (PMEL). He retired from Director of PMEL in 2010, after 40 years of NOAA service.

A Survival Capsule is a “Personal Safety System” designed to protect the occupants from such Natural Disasters as:-

- Tsunami's
- Typhoons
- Tornadoes
- Hurricanes
- Cyclones
- Lahares
- Tidal Surge
- Earthquakes
- Volcanoes



# What Does it Look Like?



# Does it Come In Different Sizes?



# Personal Safety System Advantages

## Some Advantages of the Personal Safety System

Pre - Tsunami
During Event
Post Event

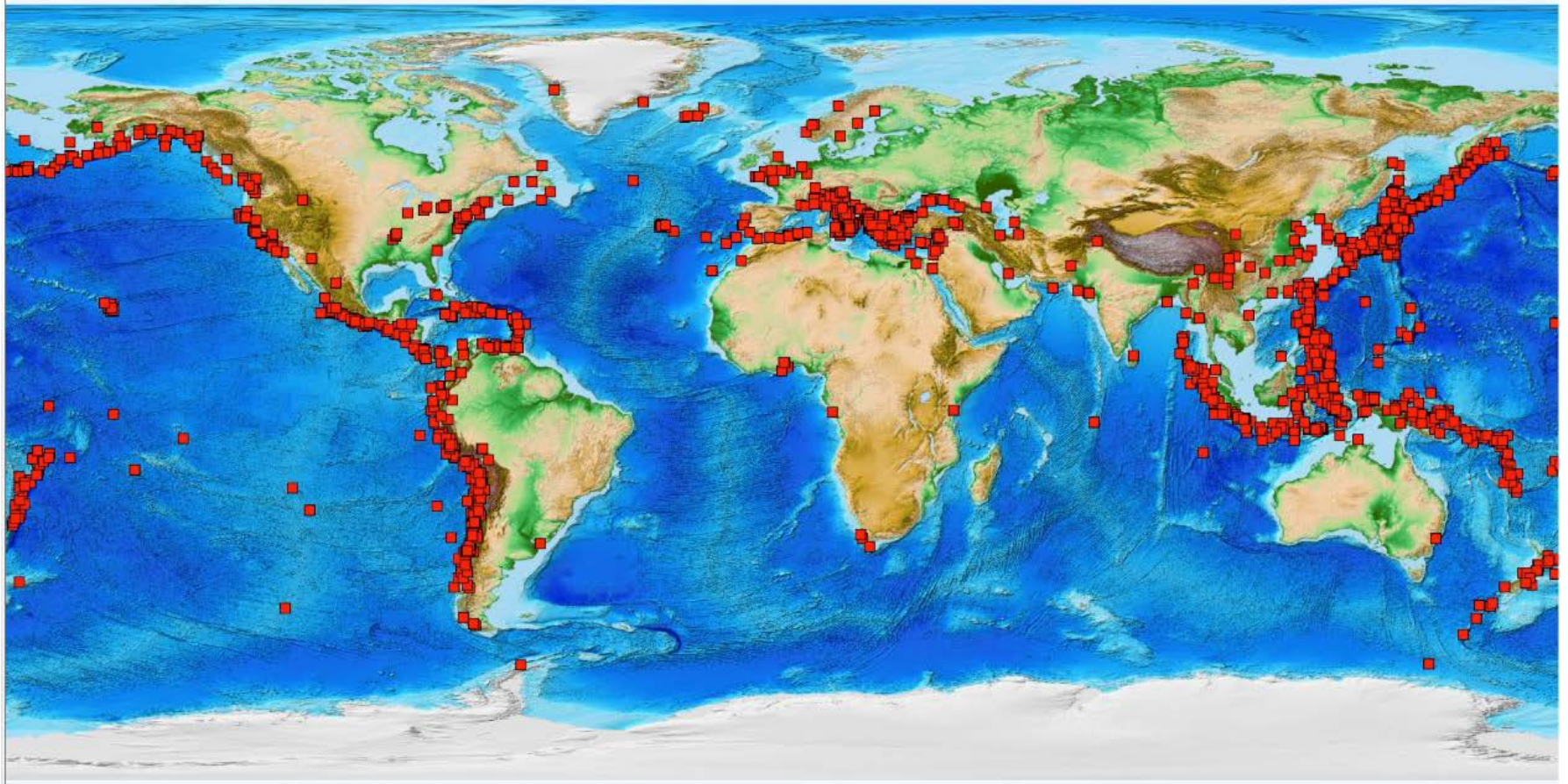
1. Capsule resides on or near home, work place etc.
2. No need to evacuate to high ground or safe havens
3. Easy access to capsule especially during a night time event
4. Streets are hazardous due to earthquake damage
5. Capsule can protect from earthquake then tsunami
6. Accessible with minimal warning time
7. Easy evacuation for young, old & infirm family members etc.
8. Personal environment helps to relax and reassure children
9. Capsule is not vulnerable to unknown water height
10. Provides warmth, shelter, security during post tsunami period prior to rescue crews arriving



# Why a Personal Safety?

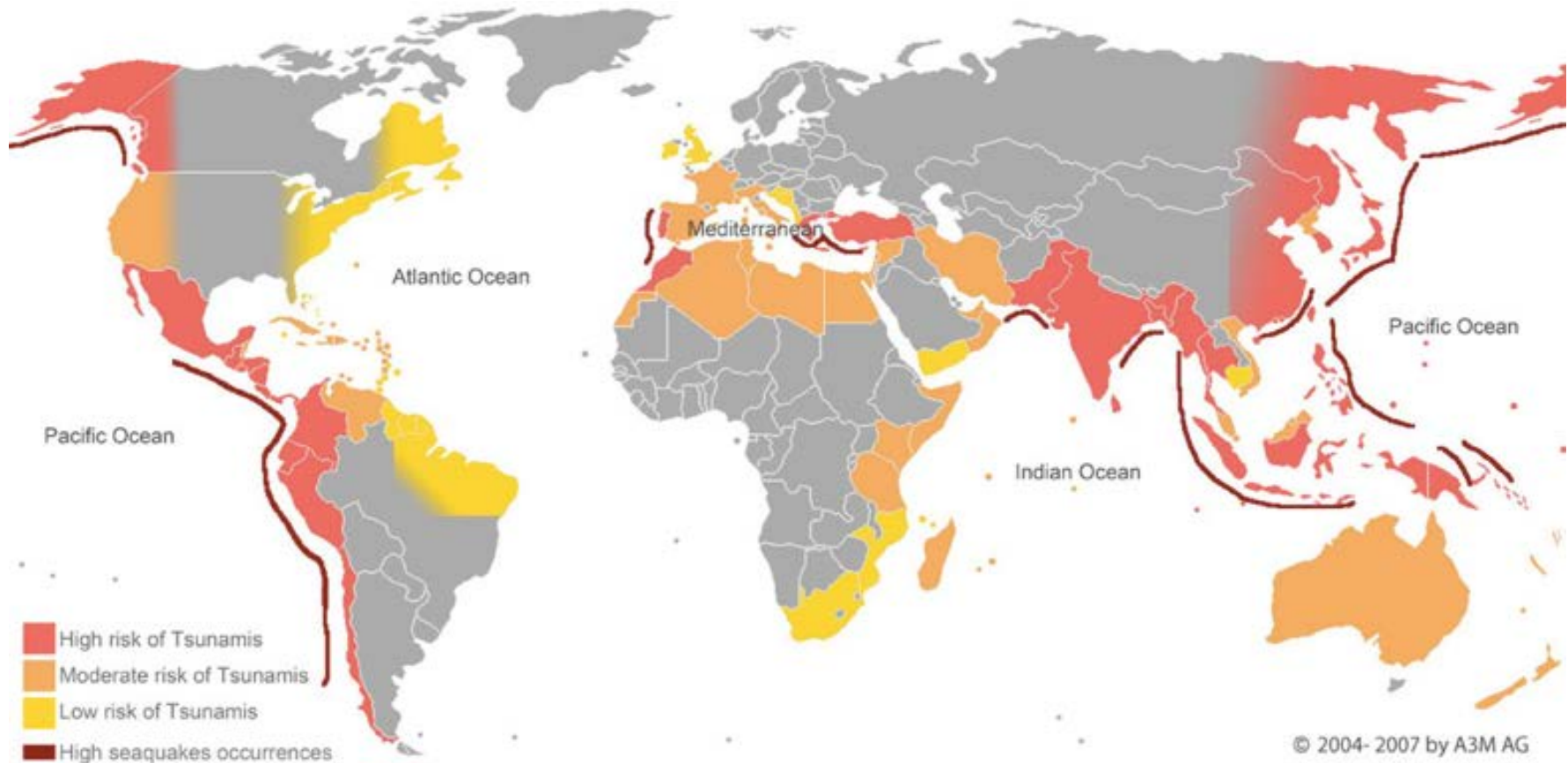


# Human Vulnerability – Historical Data





# Tsunami High Risk Regions





# The Dangers



Disaster countermeasures building in Minamisanriku Town, Miyagi Prefecture. The main town office was located just to the left.

Picture from when the tsunami hit



The tsunami has surpassed the top of the disaster prevention countermeasures building in Minamisanriku Town, Miyagi Prefecture (3 stories, 12m high) (picture taken on 3/11 by a town employee)



# Case Study – Nankai Trough – Japan.

## Mitigation Options for the Predicted Nankai Trough Tsunami

### 南海トラフ地震の想定死者数と津波到達時間及び津波高

#### 南海トラフ地震の想定死者数

(冬の深夜発生、風速秒速8メートルの場合の最大値)

- 10万人以上
- 1万人以上10万人未満
- 1000人以上1万人未満
- 1000人未満



#### 都府県別想定津波到達時間及び津波高



Estimated Japanese Impact: **323,000 deaths and 220 trillion yen economic loss**

# The Human Tragedy

## Disaster takes toll at shelters

The Yomiuri Shimbun

Fourteen elderly people evacuated from care facilities near the Fukushima No. 1 nuclear power plant have died, it was learned Thursday.

The 14 people comprised eight women and six men from Futaba Hospital and the Dohiru Futaba elderly care facility in Okumamachi, according to the Fukushima prefectural government's disaster countermeasures headquarters and other sources. All are believed to have been bedridden or suffering from other serious ailments.

On Wednesday, a woman in her 80s died from a heart attack after fleeing to an evacuation center set up in the gymnasium at Daiichi Middle School in Rikuzen-Takata, Iwate Prefecture. Hers was the first confirmed death of a person who had been taken to a shelter after the quake.

unit's high-pressure water cannon truck was ready to spray water Thursday evening.

More than 10 riot police officers were moving toward the power station.

Initially the MPD's water-blasting operation was planned for the No. 4 reactor, but TEPCO pressed for the No. 3 reactor to be given priority as it was in a more critical state.

The water cannon was to be kept about



The Yomiuri Shimbun

Yoshikatsu Hiratsuka weeps next to where his mother's body remains buried under rubble in Onagawacho, Miyagi Prefecture, on Thursday morning. (Story on Page 16)

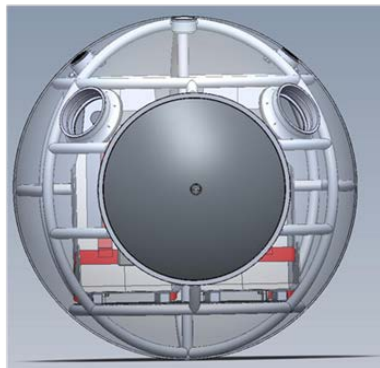
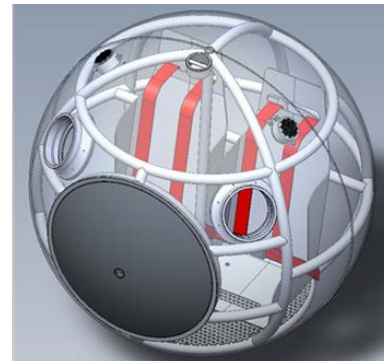
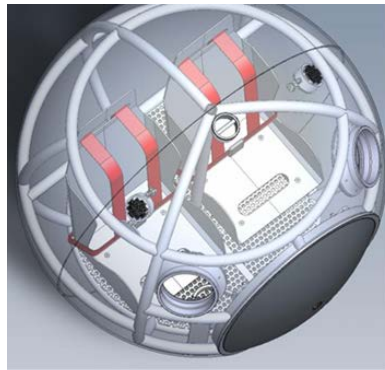
# Recent Tsunamis

## Recent Events:-

- 12/26/2004 - Indian Ocean Earthquake and Tsunami off the Coast of the Island of Sumatra  
***Death Toll ≈ 225,000 people***
- 3/11/2011 - The Great Northern Earthquake and Tsunami Sendai, Japan  
***Death Toll ≈ 22,000 people***



# About the Capsule



# Started with an IDEA

## Cannon Beach, Oregon June 2010

This is where the concept of a personal safety system was first envisioned.



## Original Concept Capsule Nov 2010

The original capsule designs started out as 4 & 6 person capsules with two doors



## NASA Contest

### NASA Tech Brief Competition May 2011

The capsule entry gained 9th position out of approximately 350 entries.

## Prototype Capsule Nov 2012

The Prototype Exposition Capsule was built and prepared for the Yokohama Exposition



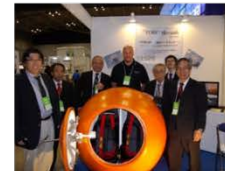
## Test Capsule Built Jan 2013

Test Capsule was built and testing took place at a Test Laboratory in Seattle..



## Yokohama Exposition Feb 2013

The prototype capsule appeared at the Yokohama Disaster Preparedness Expo



## Production Capsule June 2013

The first Production Capsule was Shipped to Japan and was put through water flotation trials in Tokyo Bay with Max Gross Weight.



## Sendai Disaster Preparedness EXPO August 2013

The first Production Capsule was Shipped to Japan



## Hamamatsu EXPO Shizuoka Prefecture April 2014

Three Production Capsules were built in Japan in three different prefectures. One appeared in the Hamamatsu Disaster Expo.

# Load Case Derivation

Characterizing load cases requires identifying debris types and objects of impact either from videos, research papers, photographs, personal experiences, consulting experts in this field (Dr. Eddie Bernard) etc. Once the debris field components have been identified it is possible to then create a set of load case categories as shown below. Initial classification developed the following set of load case categories:-

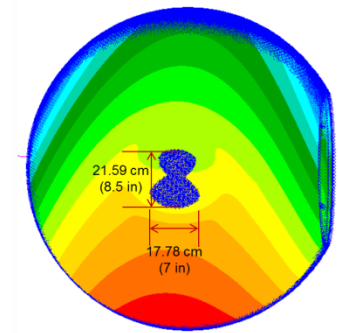
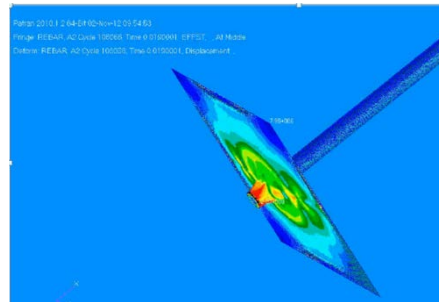
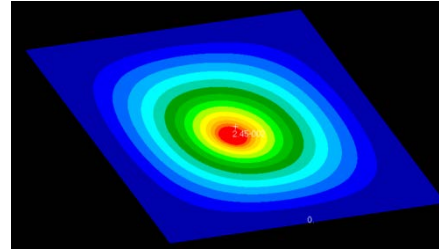
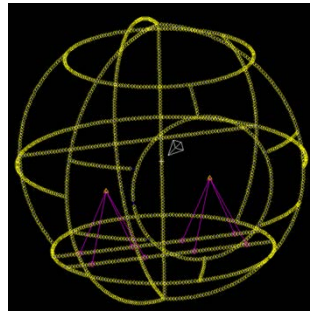
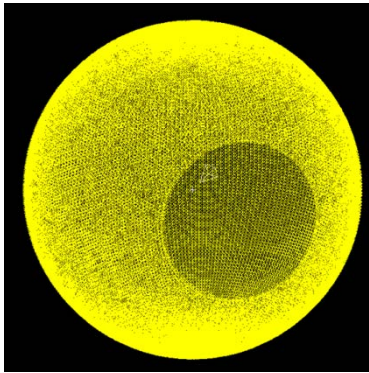
1. Small Object Impact
2. Large Object Impact
3. Sharp Object Penetration
4. Damming Loads
5. Thermal Exposure

Test Type		Specification	Level	Added Mass
1	Telephone Pole Impact	SUR-001-7001 3.3.1 SCL001	0.154 m	108.9kg
2a	Wall Impact	SUR-001-7001 3.3.2 SCL002a	0.768 m	108.9kg
2b	Wall Impact	SUR-001-7001 3.3.2 SCL002b	3.04 m	108.9kg
3a	Rebar Penetration	SUR-001-7001 3.3.3 SCL003a	4.07 cm	108.9kg
3b	Rebar Penetration	SUR-001-7001 3.3.3 SCL003b	16.29 cm	108.9kg
3c	Rebar Penetration	SUR-001-7001 3.3.3 SCL003c	36.65 cm	108.9kg
3	Rebar Penetration	Customer Specified	73.3 cm	108.9kg
4	Debris Damming	SUR-001-7001 3.3.5 SCL005	177,928 N	0
5	Floatation	SUR-001-7001 3.3.6 SCL006	1 min	0, 108.9kg
6	Burn Test	SUR-001-7001 3.3.7 SCL007	30 min	0



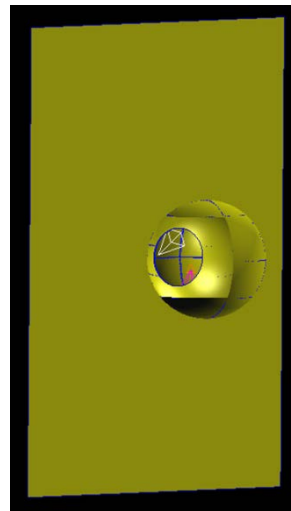
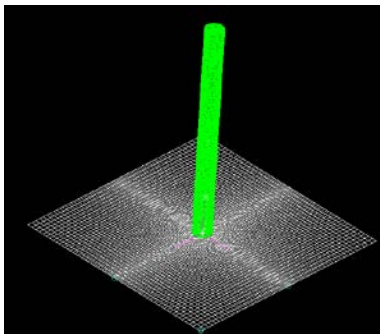
# The Analysis

$$D_{dm} = 1/2 \rho_s C_d B_d (hu^2)_{max}$$



$C_d$  = drag coefficient

$(hu^2)_{max}$  = momentum flux



# Certification & Testing

The Survival Capsule was designed and tested in stages similar to that used in the aerospace industry.

## Stage 1: Computer Simulation & Stress Analysis

- MSC Software (Patran / Nastran / Dytran / Marc)

## Stage 2: Final Design Development

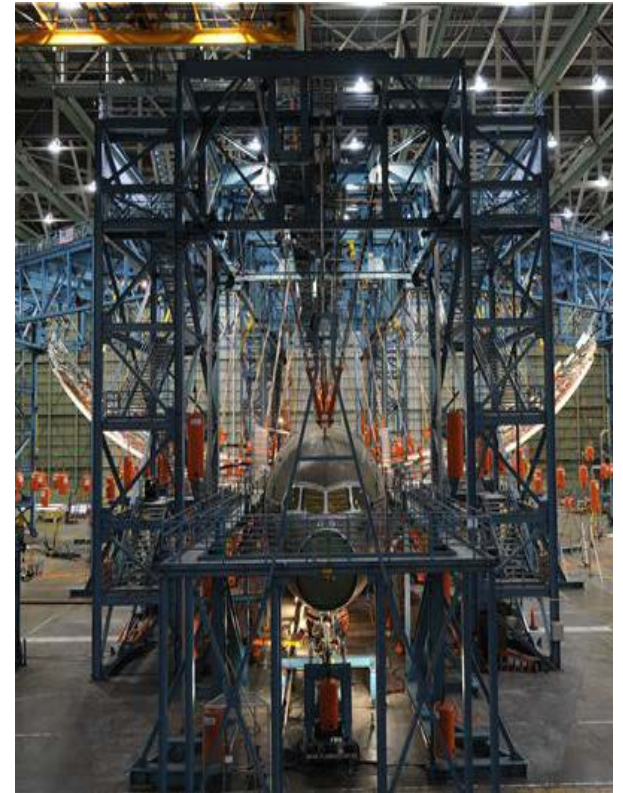
- Data gathering from tsunami experts
- Preliminary Design Review (PDR)
- Critical Design Review (CDR)
- Final Design Review (FDR)

## Stage 3: Physical Testing

- Certification testing performed based on a set of enveloping load cases that encompass all critical load conditions that the capsule will be exposed to.

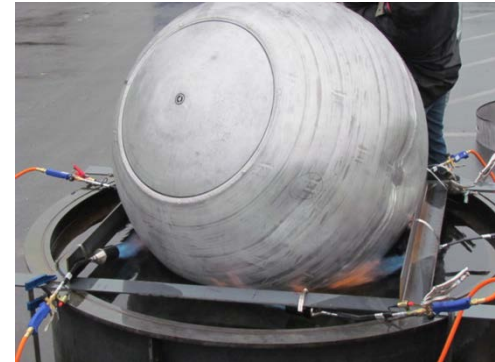
## Stage 4: Correlation between Analysis & Test Data

- Test results correlated to within 5 – 10% of analysis results leading to certification

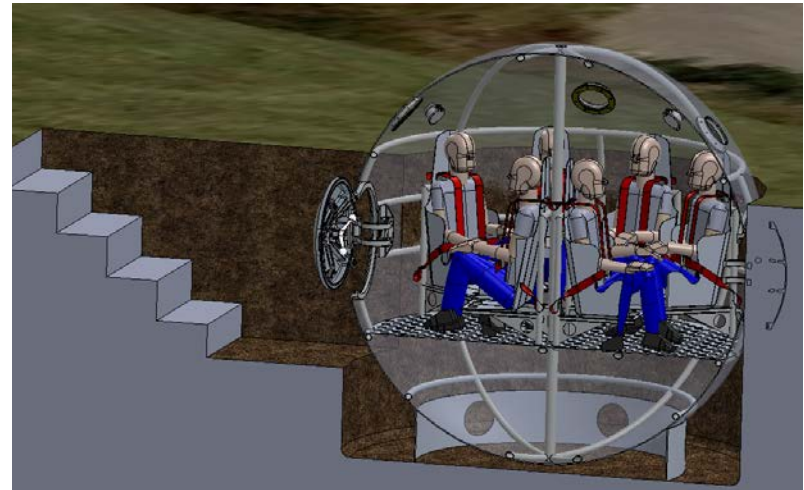
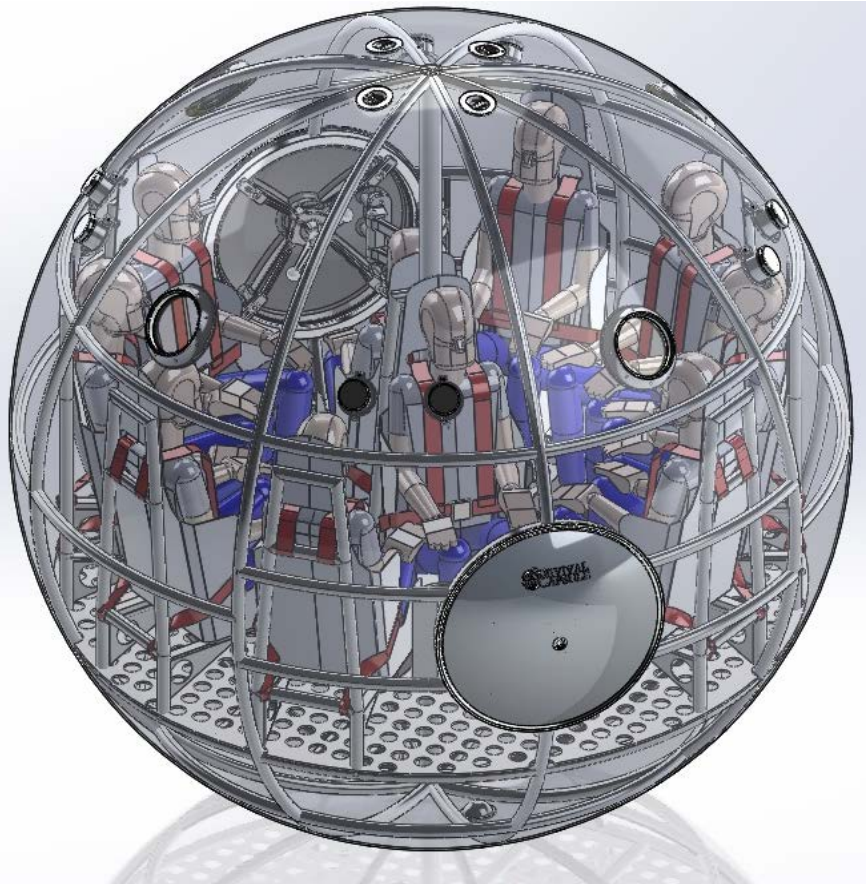




# The Test Program



# Where Does One Keep a Capsule?



# Current Status – Where is the program at Today?





# The Challenges

The first Challenge was to understand the Danger. This was achieved partly by:

- Visiting Sendai to see the Damage, Destruction & Debris
- Talking to Survivors
- Talking with Experts

The other challenges are realizing the Hurdles and Risks. Survival Capsule realized three (3) significant hurdles and risks:-

1. Developing a new Product(s)
2. Developing a new Market
3. Changing a mind set – up until now we have 2 choices
  - Vertical Evacuation
  - Horizontal Evacuation
  - Now we have “Ride It Out”

# Marketing

Why all the focus on Japan?

- Japan is the World Leader on Tsunami Mitigation.
- The World is looking to Japan to see how they prepare for their next big Earthquake/Tsunami
- There is a 90% that in the next 20 years the Nankai Trough will cause a Tsunami that could kill as many as 325,000 people
- If you design a new watch – and target your initial sales in Switzerland with success, the chances are that you will be successful else where

Many other markets are emerging:-

- Military (Pacific Island Typhoon Protection)
- Off Shore Oil (Thermal Protection Escape Pods)
- Forest/Bush Fires (Fire Fighter protection)
- Entertainment!! (Extreme Sports)
- Even a recent request for Volcanic Eruption Protection for Hikers. (Mt. Ontake, Japan)

# Manufacturing

Survival Capsule has now built three Capsules in Japan at three different manufacturing facilities.

- Shizuoka Prefecture
- Okoyama Prefecture
- Mie Prefecture

**Survival Capsule** can ship kits to Japan to be assembled by Japanese OEMS for Government Orders

**Survival Capsule** can ship complete Capsules assembled in the State of WA for Private and Business orders





# Sales and Distribution

Survival Capsule has several Partners in Japan:

Marketing & Government Liaison	- Tokyo , Japan
Marketing, Sales & Distribution	- Osaka, Japan



# Sales and Orders

## **Sales To Date:-**

Survival Capsule has sold 10                      2 Person Capsules (Japan)

## **Current Negotiations – 2 Person Capsule**

- 2 Person Capsules (Housing Development Companies)
- Shizuoka Prefecture considering Subsidies of 66%

## **Current Negotiations – 10 Person Capsule**

- 10 Person Capsule – Businesses & Bank Customers (Japan)
- 10 Person Capsule - Hospital Group (8) Fukushima, Japan

**Sold 1** – 10 Man Capsule – The Adrift 2015 Project



## Guide to Exhibit

10<sup>th</sup> Anniversary  
Risk Control in Tokyo

**RISCON**  
TOKYO

**Security & Safety Trade Expo 2014**  
**Oct.15 WED – 17 FRI 10:00 – 17:00**

**Venue** Tokyo Big Sight West Hall 1&2

**Organizer** Tokyo Big Sight Inc.  
**Special Sponsor** Tokyo Metropolitan Government

**Sponsors**

Central Office (Disaster Management) / National Police Agency / Fire and Disaster Management Agency / Ministry of Education, Culture, Sports, Science and Technology / Ministry of Finance, Labour and Welfare / Ministry of Economic Trade and Industry / Ministry of Land, Infrastructure, Transport and Tourism / Japan Meteorological Agency / Japan Coast Guard / Ministry of Culture / National Diet Library Association / Japan Association of City Mayors / National Association of Towns and Villages / U.S. Commercial Service / Information-Technology / Firearm Agency, Japan (Exhibitor)

**Show Management**

ATEXCELLE

**Special Affiliated Show** **SECCO** Booth (Japan Exhibition & Conference for Antiterrorism)

CONSULATE GENERAL OF JAPAN  
601 UNION STREET, SUITE 500  
SEATTLE, WASHINGTON 98101

*Masahiro Omura,  
Consul General of Japan and  
Eikei Suzuki,  
Governor of Mie Prefecture*

*Cordially invite you or your representative to*

**Mie-Washington Business and Cultural Exchange**  
*featuring*  
**Iga Beef and Other Mie Delicacies**

**Monday, August 25, 2014**

**6:00 pm Door Open**  
**6:30 - 8:30 pm Reception**  
*Consul General's Official Residence*  
**Queen Anne Hill, Seattle**

*Beverages and Hors d'oeuvres will be served during the event.*

*RSVP by August 15, 2014 to  
RSVP@infra-innovations.com  
or call 206.745.0878*

*~ Space is limited. Only the first 80 RSVPs will be accepted ~*

*Map/direction enclosed*

**GOOD TIMES:** Our pick of the coolest watches

TECH • SCIENCE • MODEL AIRCRAFT • OUTDOOR [www.popsci.com/magazine/jan-08](http://www.popsci.com/magazine/jan-08)

# Popular Mechanics

JANUARY 2008 \$6.99 US  
\$7.99 CAN/MEX  
\$10.99 REST OF WORLD

## SURVIVAL TECH

**DEAL WITH ANY DISASTER**  
NEW WAYS TO PROTECT CITIES,  
HOMES & FAMILIES

**STRONG AND SILENT**  
ZERO'S ELECTRIC MOTORCYCLES  
ARRIVE IN SA: WE STEP AHEAD

**SCAN ARTISTS**  
DIGITAL FORENSICS: HOW  
ANCIENT WHALES DIED

BUILD A STURDY GARDEN BENCH

ON THE BALL  
TECH TRANSFORMS  
THE WORLD CUP

GREAT LABO...  
LAPTOP

災害から…家族を守る、企業を守る、地域を守る。



# SURVIVAL CAPSULE



# Media Coverage

Media Coverage is essential in order to promote a new product if you do not have a large advertising budget

Survival Capsule is currently engaged on several interesting projects:-

- A co-production 90 minute documentary offering 165 Million Households, 173 Countries and 45 Languages (USA & UK)
- ADRIFT 2015 – Living on an Ice-berg for 12 months (UK, USA, Italy & Germany)
- Reality TV Show #1 – 10 Man Capsule – (USA)
- Reality TV Show #2 – 2 Man Capsule – (Germany)
- Tech Show TV – 2 Man Capsule – (UK)
- Mock Deployment and Retrieval – Japanese Navy, Coastguard – (Japan)



## Where Next

Survival Capsule is just starting out. There are many people in many countries who live in danger – Survival Capsule would like to make this product available for all people regardless of income and personal wealth.

So we are talking with the-

- The World Bank
- Japanese Government Foreign Aid Agency
- Survival Capsule may begin production in Thailand with the help of a Japanese Company (OEM)

New Products – Survival Capsule is currently designing new products and is hoping to receive funding from the World Bank to help development costs

# Contact Information



727 2<sup>nd</sup> Street, Suite A  
Mukilteo, WA, 98275  
Phone: (425) 290-9201  
Fax: (425) 290-9297  
Website:  
[www.survival-capsule.com](http://www.survival-capsule.com)

*Survival Capsule LLC Proprietary*

Julian Sharpe  
President / CEO  
(425) 290-9201 Office  
(425) 591-9692 Cell  
[juliansharpe@survival-capsule.com](mailto:juliansharpe@survival-capsule.com)

Scott Hill  
Vice President  
(425) 290-9442 Office  
(425) 418-7944 Cell  
[scotthill@survival-capsule.com](mailto:scotthill@survival-capsule.com)

Eddie Bernard  
Vice President for Research  
(425) 290-9201 Office  
(206) 714-1728 Cell  
[eddiebernard@survival-capsule.com](mailto:eddiebernard@survival-capsule.com)