BROADLEAF CAPITAL INTERNATIONAL PTY LTD

ABN 24 054 021 117

23 Bettowynd Road	Tel: +61 2 9488 8477
Pymble	Mobile: +61 419 433 184
NSW 2073	Fax: + 61 2 9488 9685
Australia www.Broadleaf.com.au	Cooper@Broadleaf.com.au

Specialists in Strategic, Enterprise and Project Risk Management

RISK MANAGEMENT BEYOND 2001

Conference presentation and notes for
NAVSAFE 01, Managing Safety & Risk into the Future
Hosted by the Navy Certification Safety and Acceptance Agency (NSCA),
Royal Australian Navy Systems Command
Sydney, 23-24 May 2001

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NAVSAFE 01 CONFERENCE
MANAGING SAFETY AND RISK INTO THE FUTURE
23-24 MAY 2001

**RISK MANAGEMENT
BEYOND 2001**

Dr DALE F. COOPER
BROADLEAF CAPITAL INTERNATIONAL

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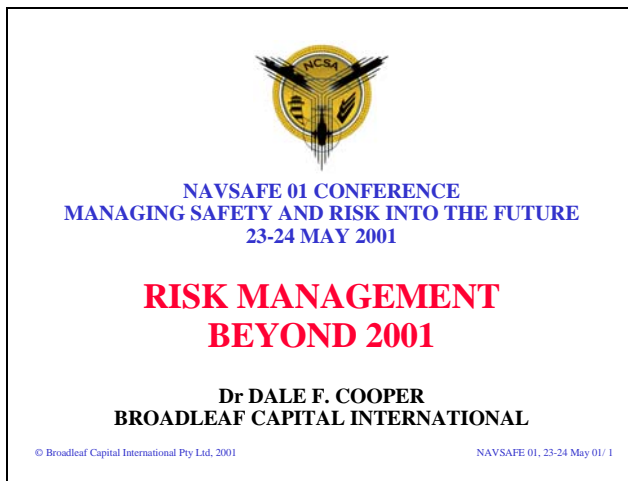23 Bettowynd Road
Pymble NSW 2073 Australia

Tel: +61 2 9488 8477
Fax: +61 2 9488 9685
Mobile: 0419 433 184
Cooper@Broadleaf.com.au
www.Broadleaf.com.au

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1   Introduction

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**RISK MANAGEMENT:
FUTURE DIRECTIONS**

➢ Best practice risk management

➢ Risk management in an organisation

➢ Supporting processes

➢ Risk management culture

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I have been asked to provide a few thoughts on the future directions for risk management as I see them.

My recent activities have been concerned more with procurement than safety, but there are useful transfers of process, knowledge and application between the two areas.

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2   Best Practice Risk Management

INTERNATIONAL BEST PRACTICE, AS/NZS 4360:1999

Who should be involved?

Communicate and consult

Establish the context	Identify the risks	Analyse the risks	Evaluate the risks	Treat the risks
What do we want to achieve?	What might happen?	What might that mean for our key criteria?	What are the most important things?	What are we going to do about them?

Monitor and review

How do we keep them under control?

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AS/NZS 4360 has become international best practice.

It is similar to the steps used for operational safety processes, with the addition of the context step. In my view this is a critically important step, as it provides the base for the rest of the process, and particularly it sets out the criteria to be used for measuring the consequences of risks and the criteria for making judgements about priorities and actions. Note that the term 'risk management' is used to describe the whole process, and 'risk treatment' refers to the development and implementation of action plans for dealing with identified risks. This differs from much US terminology, where this latter step is called 'risk management', and there is often a separation between risk analysis, possibly conducted independently, and decision making or policy setting.

FEATURES OF AS/NZS 4360

➢ The process is very general
 – It has wide applicability
➢ It is not detailed
 – Specific tools & processes are needed
➢ It is a good way of classifying risk & safety management activities
 – It helps identify gaps
 – It promotes a holistic view, not ad hoc
➢ We are quite good at it

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Application: safety, operations, maintenance, …

Much safety work focuses on specific aspects of the process, with few holistic frameworks (with one or two notable exceptions). As a consequence, there often seems to be confusion, at least to this outsider, when safety practitioners talk about their craft and the key issues. For example:

–   There is sometimes confusion between treatments (ways of dealing with specific problems or classes of problems) and overall management processes;

–   Lists of issues often contain items from quite different parts of the process, with little differentiation or classification (e.g. from lists yesterday: incident reporting, treatments for specific risks, controls and barriers, cultural aspects …)

ESTABLISHING THE CONTEXT: GLOBAL PERSPECTIVE

➢ Targets for performance
 – Objectives
 – Stakeholders
 – Criteria, indicators & standards
➢ Change
 – New technologies, regulatory change
➢ Scope & focus of risk management
 – What might go wrong?
 – How can we do better?

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Criteria are important for

–   Assessing consequences of risks, and hence setting priorities;

–   Developing and evaluating treatment options;

–   Classifying incident reports.

Scope & focus of risk management: the trend is to move from

–   What might go wrong? Conformance focus (in corporate governance terms)

to

–   How can we do better? Performance focus, looking at opportunities as well as risks

Increasing corporate governance focus

RISK MANAGEMENT FOR PERFORMANCE

➢ Focus on what might happen
- Risks **and** opportunities
- Ways of avoiding problems
- Ways of exploiting opportunities

➢ Part of strategic thinking

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Note the linkages to Monitoring & Review. The environmental scan may be part of a more strategic process, and it may occur in the Context step, but it is really about identification of sources of risk.

RISK IDENTIFICATION: EARLIER & BROADER

➢ Environmental scanning
➢ SWOT
➢ Hazard & vulnerability analysis
➢ Trends & warning signals
- Monitoring & review processes
- Incidents & near-misses

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Controls are designed to make risks less likely, or to mitigate their consequences. They include:

- Management systems and procedures, formal processes, quality management, audits, monitoring processes;
- Human systems, training, education, culture;
- Physical controls, control systems, physical barriers, engineering solutions;
- Commercial and legal controls, administrative controls, contractor or supplier selection processes, commercial terms, contract structures, liquidated damages.

CONTROLS: MORE GENERAL CONCEPTS

➢ Management systems & procedures
➢ Human systems, training & culture
➢ Physical controls & barriers
➢ Commercial & legal controls

… but they may not all work well !

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The headings correspond to some of the words used in James Reason's failure areas:
- People
- Technology
- Processes

CONTROLS & RISK ASSESSMENT

Much safety-related effort is concerned with the difference between

– Actual risk

    Based on likelihoods & impacts, with the current controls in place

– Inherent risk

    How bad might it be if there were a credible failure of controls ?

The difference between the two indicates the importance of the controls.

It is useful to distinguish between the two, as people treat controls in different ways when they do risk assessments. If you don't know how controls have been considered, you can't really understand the assessment outcomes.

TREATMENT ACTIONS
(move towards the bottom right corner)

Impact

High — Low

Frequent   **Major risks** → **Problems** Systems & processes

Likelihood

Catastrophes Contingency & recovery plans

Rare   → **Minor risks**

'Incidents' arise in the top-right-hand side of the diagram

'Accidents' arise on the bottom-left

The monitoring process should provide the link between the two, with analysis of incidents leading to the development of new controls to reduce the likelihood or the impacts of potential risks

OBSERVE -- LEARN -- ACT

3   Risk Management in an Organisation

ORGANISATIONAL RISK MANAGEMENT

➢ Risk assessment underpins most organisational tasks

– Strategy development, planning , budgeting, operational activities ...

➢ Aim of RM in an organisation

– Part of day-to-day management

– Not a 'one off' activity

Becoming part of 'business as usual' is a prime focus of safety risk management, but it is not always easy to achieve

'Everyone makes NAVSAFE work' – it is conceived as an organisational process

SCOPE OF RISK MANAGEMENT APPLICATION
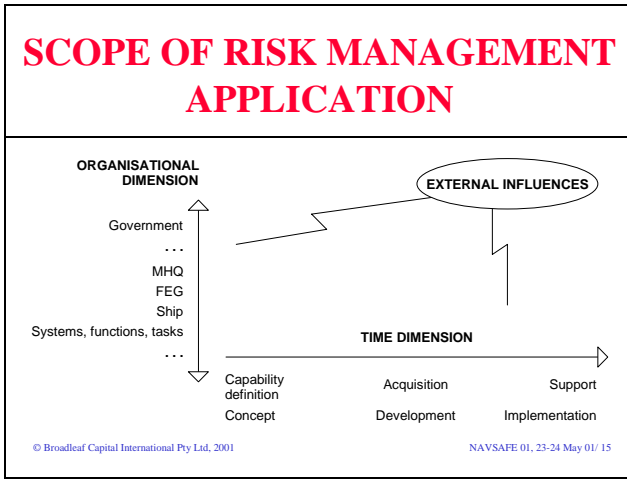
Capability definition …is a procurement perspective

Concept … is a far broader perspective, and it applies at all levels. At MHQ or FEG level, the concept might relate to policy or operations; on a ship, it might relate to a new task. One of my mining clients uses the RM process for work teams when they plan a new job or maintenance activity, and records the risks and treatment plans for future use.

LINKAGES ACROSS THE MATRIX
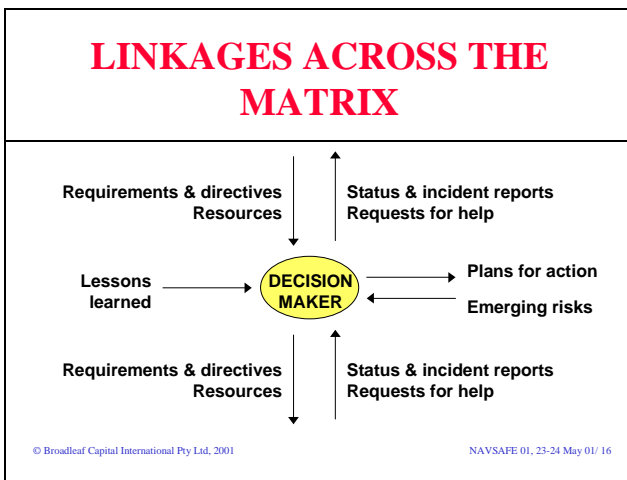
Lessons learned from the past: 'Never waste a good accident'

Incident reports help to identify emerging risks, but they are not the only tool

MULTI-LEVEL RISK MANAGEMENT
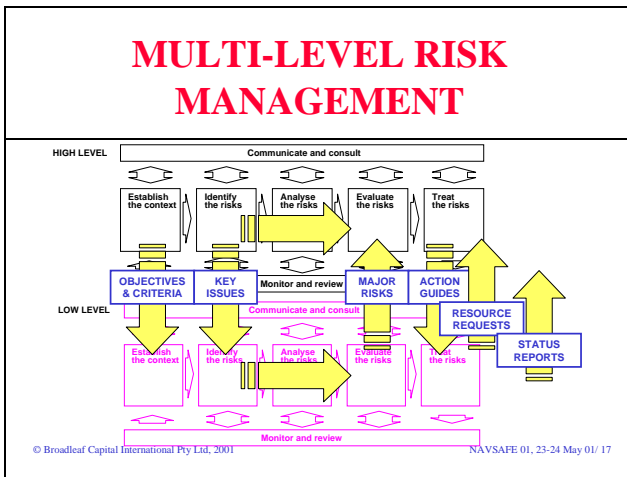
Up and down the organisation, there need to be links to ensure consistency and unity of purpose is maintained.

Status reports include incident reports

REQUIREMENTS

- Consistent reports of actual & emerging risks
- Comparability across the organisation, & through time
- Visibility of key treatment actions & their status
- Transparency & traceability of decisions
- Timely requests for assistance, where necessary
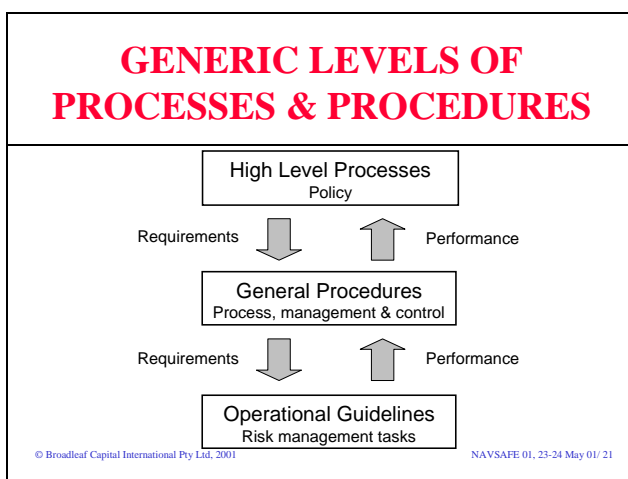- **PLENTY OF WARNING, NO SURPRISES !!**

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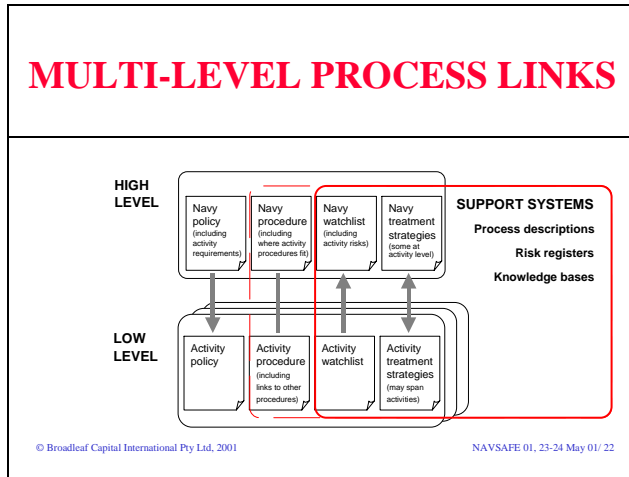
REQUIREMENTS: PROCESSES

- Commitment & ownership by senior managers
- Assurance that risks are identified & being managed well, throughout the organisation
- Balanced, cost-effective application of effort
- Consistency through the organisation
- Integration with objectives & plans at all levels
- Responsive & adaptable to change
- Cost-effective implementation

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4　　Supporting Processes

GENERIC LEVELS OF PROCESSES & PROCEDURES

High Level Processes
Policy

Requirements　→　←　Performance

General Procedures
Process, management & control

Requirements　→　←　Performance

Operational Guidelines
Risk management tasks

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Safety matters at all levels
It is often important to separate the functions at different levels – policy makers should not necessarily be involved in solving specific problems or developing specific tools

There are links between the levels, involving policy, procedures, risks and treatments
Support systems provide an under-pinning of information and knowledge, often web-based

5   Risk Management Culture

PRACTICAL REQUIREMENTS FOR CULTURE CHANGE

- ➢ Leadership from the top
- ➢ Champions through the organisation
- ➢ Success stories
- ➢ Culture of open reporting
- ➢ Centre of excellence
- ➢ Training
- ➢ Support tools
- ➢ Identification of inhibitors

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This has many similarities to the OHS Risk Management model
I have added 'culture of open reporting' after yesterday's session, because it is an interesting and important addition.

6   Summary

OUTCOMES AND BENEFITS

- ➢ All significant risks & opportunities are identified
- ➢ Identified risks & their outcomes are understood & quantified, as far as necessary for decision making
- ➢ Assessments of risks are comparable, to support consistent priority setting & resource allocation
- ➢ Strategies for treating risks take account of opportunities to address more than one risk with a particular strategy, & integrate related strategies where this is worthwhile
- ➢ The process itself & the risk treatment strategies are implemented cost-effectively

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Now some views on the current state and future difficulties …

PROGRESS & DIRECTIONS

➢ Sound basic process
➢ Supporting tools
➢ Continuous review & improvement
➢ Cultural aspects
➢ Organisation-wide implementation

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Sound basic process: AS/NZS 4360 is an excellent process, and we are pretty good at making it work
Supporting tools: we are developing supporting tools, although some efforts have been misdirected
Continuous review & improvement: the better organisations are building systems that encourage continuous review, feedback and improvement of the process. This is an area where the general risk management community could learn more from the safety community, who have become adept at it
Cultural aspects: we are all learning about the importance of cultural aspects, because most RM implementations require some form of culture change. The challenge is to design systems and procedures that align with the current ways in which people think and work
Organisation-wide implementation: the better organisations are getting there, but it is difficult. It takes time to get the cultural factors in place. Even when an organisation-wide process is in place, sustaining it involves a further set of challenges.

OPTIMUM RISK ALLOCATION

➢ How much risk *can be* transferred?
➢ How much risk *is* transferred?
➢ What are the residual risks?
➢ What skills are required to manage the new risks created?

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How much risk **can be** transferred? There may be legal, practical and moral constraints.
How much risk **is** transferred? The contract or relationship may not transfer risk as intended.
What are the residual risks? What risks are not transferred, and what new risks arise as a consequence of the contractual or other transfer mechanism?
What skills are required to manage the new risks created when a risk is transferred? We often get rid of a technical risk, but we then have to manage the contractor. If skills have been excised from the organisation, do we have the competence to do it well?
Transfer in this case may include delegation in the command structure, as well as contractual transfer (for example, through outsourcing).

RISK PRICING

➢ What is it worth to transfer a risk?
➢ Savings or cost reductions
  … compared with ...
➢ Loss of
  – Expertise
  – Corporate memory
  – Control of assets ...

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In safety, many of the trade-offs are moral issues.

RISK TREATMENT & SAFETY CRITERIA

- Costs & outcomes, ALARP
- Criteria are based on judgements
  - Difficult or impossible to measure
  - Usually measured in different units
  - Trade-offs are often an emotive issue
- Criteria change through time
  - "We will be judged by tomorrow's standards, not today's"
- How can we be sure we've got it right?

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NANCY LEVESON: SAFE TORPEDOES

And later, when they tested this torpedo, they told me ... 'Well you know, we took her out into this testing ground and we tested this torpedo and every time we tried to fire it, it came out of the torpedo tube and turned itself off and went down to the bottom and it just sort of lay there.'

And I said, 'Well, it's safe.'

And they said, 'Well the Navy didn't want to pay for this safe torpedo.'

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Example: Nancy Leveson, Boeing Professor of Computer Science and Engineering at the University of Washington in Seattle, was asked to look at safety-critical systems in torpedoes.

'… they told me that they weren't so concerned that the torpedo missed the other guy, but they were concerned that it turned around 180-degrees and hit them …'

The detailed quotes and reference are provided at the end of the paper.

NANCY LEVESON: SAFE TORPEDOES

And this is really I guess when I started realising that there are trade-offs between safety and reliability, and what they had to do was one by one, take off safety devices in order to make this thing more reliable and more effective.

And this is true in a lot of our systems, that making things safe may require some compromises.

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CONCLUSION

➢ The challenge is to make sure we have processes that allow us to really understand the compromises we are making, and then to make informed decisions

➢ I think we are on the right track, but we still have a way to go

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7   About Broadleaf

BROADLEAF'S RISK MANAGEMENT SERVICES

➢ Strategic & policy risk management
➢ Project & procurement risk management
➢ Risk assessment workshop facilitation
➢ Risk management plans & implementation
➢ Quantitative risk & financial modelling
➢ Risk assessment for private financing options
➢ Risk management training
➢ Risk management procedures & review

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Contacts:
Dr Dale Cooper
        Cooper@Broadleaf.com.au
Phil Walker
        Walker@Broadleaf.com.au
Pauline Bosnich
        Bosnich@Broadleaf.com.au
Dr Stephen Grey
        Grey@Broadleaf.com.au
Geoff Raymond
        Raymond@Broadleaf.com.au
Dennis Goodwin
        Goodwin@Broadleaf.com.au
Mike Wood
        Wood@Broadleaf.co.nz
Grant Purdy
        Purdy@Broadleaf.com.au

NAVY CERTIFICATION SAFETY AND ACCEPTANCE AGENCY (NCSA)

NCSA Logo & Introduction

The NCSA Logo contains many of the symbols that illustrate the reasons for the agency's existence. The centre circle contains a lighthouse, which to mariners represents safety; and the three tick symbols represent integrity, fitness for purpose and acceptance. The overlaid symbols of a ship, submarine and helicopter represent the three primary environments for naval operations. These three symbols are also common with the Navy Systems Branch logo, reflecting our interdependence and common heritage. The surrounding rope rings symbolise the security that comes from the integration of our maritime regulatory, certification, safety and acceptance activities in a single independent agency.

Our Core Business is:
− Certification,
− Safety and Regulation,
− Audit, and
− Acceptance.

The NCSA Mission

We support the cost effective delivery of Navy capability through oversight and delivery of a regulatory, certification and acceptance system that ensures the safety, fitness for purpose, material and operational integrity of Navy platforms, systems people and support.

The NCSA Vision

NCSA is committed to delivering responsible and independent corporate governance encompassing the safety, environmental compliance, fitness for purpose and acceptance of the Navy's platforms, systems, people and support infrastructure.

For further information, contact Navy.Safety@cbr.defence.com.au

ABC Radio National, Background Briefing

Extract from High Anxiety, Sunday 8/12/96. The full transcript of the program is available at
http://www.abc.net.au/rn/talks/bbing/stories/s10618.htm
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…

Stan Correy: Nancy Leveson is the Boeing Professor of Computer Science and Engineering at the University of Washington in Seattle. Last year she published a book called "Safeware, System Safety and Computers". She's won awards for her work on system safety in aeronautics and astronautics and was the Chair of the US National Academy of Science Committee that examined space shuttle software for NASA.

When I spoke to Nancy Leveson from her home in Seattle, I expressed my surprise that as a computer scientist she was so critical of what computer technology could deliver in providing safety.

Nancy Leveson: Well I specialise in making them safe, not necessarily in encouraging everybody to use them for every possible use. I actually got started in this field a long time ago, 1980, when computers were first starting to be used as very safety critical systems, and I'd gotten a call from someone at a large aerospace firm who was making a torpedo, and they told me that they weren't so concerned that the torpedo missed the other guy, but they were concerned that it turned around 180-degrees and hit them. And they thought this was a software safety problem and I said, well I'd never heard of such a thing, but I'd look at it for them.

And later, when they tested this torpedo, they told me, they called me up and said, 'Well you know, we took her out into this testing ground and we tested this torpedo and every time we tried to fire it, it came out of the torpedo tube and turned itself off and went down to the bottom and it just sort of lay there.' And I said, 'Well, it's safe.' And they said, 'Well the Navy didn't want to pay for this safe torpedo.' And this is really I guess when I started realising that there are trade-offs between safety and reliability, and what they had to do was one by one, take off safety devices in order to make this thing more reliable and more effective.

And this is true in a lot of our systems, that making things safe may require some compromises. It's true in non high tech systems, and it's going to be true in other kinds of systems.

…