Will we React or Proact to the Aegean Wind?

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1 Introduction

One of the IMO's favorite buzzwords for the last decade or so is *proactive*. It is almost obligatory to use this neologism in any IMO submittal. Proactive refers to solving problems before they become problems; in sharp contrast to *reactive*, trying to fix a problem after it becomes apparent. The implication is clear: reactive isn't good enough.

At an abstract level, it is hard to argue with proactive. Who can be against preventing casualties before they occur? Unfortunately, at a practical level attempting to be proactive almost never leads to useful regulation, and often becomes a barrier to intelligently reacting to a casualty.

The reason why proactive does not work is that it is not the way humans work. According to the IMO, the first step in being proactive is to convene a group of "experts". They are asked to make up a list of hazards associated with a particular activity. Proactive interpreted strictly not only means working with no data, it means working with no specific experience. After all we are talking about problems that might occur in the future, but so far haven't.

So we have an arbitrarily chosen group dreaming up hazards on the basis of no experience. The results predictably are chaotic. The next step is to turn daydreaming into hard numbers. This can be done a variety of ways; but often the experts are asked to list the imagined hazards the group has come up with in order of severity. The rankings are assigned numbers. Then a statistic is calculated from these artificial numbers. Either a hazard was obvious without all this nonsense, or the resulting numbers are next to meaningless. Yet the results of this HAZID process are supposed to become the basis for all the follow on analysis which is supposed to lead to regulation.

Needless to say, such an artifical process can easily be manipulated. The most obvious form of manipulation is in the choice of experts. The main job of any special interest is to ensure that the right experts are put on the HAZID group. Once that is done, they can be assured of the result.

2 Being reactive

Contrast this with being reactive. Reactive means learning from our mistakes. Reactive means looking at real casualties, figuring out what went wrong, and coming up with fixes. Reactive is the way people work. Reactive is the way people learn. Reactive does not require an easily manipulated group of experts dreaming up hazards that might occur. The hazard is staring us in the face. The only question is: what to do about it?

A recent example is the Aegean Wind. This well-maintained bulk carrier was in the southeastern Caribbean. Somehow a fire started in the lower accommodations at 0230 Christmas morning. Nine sleeping crew lost their lives from smoke inhalation. It appears the smoke was sucked into the air conditioning system and quickly pushed throughout the entire closed-up accommodations by the HVAC fans. Something similiar seems to have happened in 1994 to the Stolidi, in which

26 sleeping crew were killed. One obvious, cheap fix: an interlock between the fire/smoke detection system and the HVAC fans automatically shutting down the fans on an alarm. Will we react properly? History is not encouraging.

3 The History of Proactive

Prior to 1993, few if anybody in marine transportation had ever heard the word, proactive. But in the very early 90's, the flag states, owners, and classification societies felt they were losing control of the regulatory process. They had been ramrodded into double hulls by the unilateral action of the USA. Most of the IMO community felt this was bad or at least unnecessary regulation. But they could see the power of public opinion, and how it could force their hand, quite possibly leading to still worse regulation, such as strict age limits on ships. The idea was that, by mandating a formal procedure for evaluating proposed regulation, they could both slow down the process and regain control. This procedure became known as Formal Safety Assessment or FSA.

In selling this approach it was important to be able to argue that FSA would offer benefits to society unobtainable from the messy, ad hoc, previous process. The major such benefit was the ability to be proactive. Within a year or two, proactive became a very popular word at the IMO.

As long as a casualty fails to catch the public eye, this tactic has been extremely successful. FSA has gotten in the way of all sorts of legislation. Given the standard FSA value of a life (equal to 50 tons of oil spilled) few if any safety measures that involve real costs can pass the mandated cost/benefit analysis. Therefore legislation has been limited mainly to paperwork, and an occaisional attempt (eg. protected bunker tanks) at a measure that aims to reduce spillage. The flag states, owners, yards, and Class can live with that.

According to FSA, a life saved is worth $3,000,000. Suppose you have a tanker safety measure that costs a million dollars per ship. To install this measure (called an RCO in the FSA jargon) on the 5300 tankers over 10,000 dwt will cost 5.3 billion dollars. Assume a ship life of 20 years. For this RCO to survive the FSA Cost/Benefit analysis, you must be able to argue that the RCO will save 1767 lives in 20 years. According to the CTX Casualty Database (CDB) in the last 20 years we've killed 592 people in casualties involving pure tankers over 10,000 dwt. So even if your RCO would save every life lost on tankers, it would not come close to qualifying. The costs are more than the benefits. To put it another way, any proposed tanker safety measure that costs more than $335,000 per ship can immediately be thrown out, since even if it resulted in eliminating all tanker deaths, it would not qualify.[1]

4 The Non-History of Reactive

One of the arguments against reactive is that it isn't enough. This may be true; but it is far worse to be non-reactive. And the history of marine transportation is one of not reacting to any casualty or casualties unless forced to by public outrage.

The examples of IMO's failure to react are numerous. Here are three of the most important.

Machinery failures

> Machinery failures are the most frequent cause category in the CTX CDB and a leading cause of spillage. Yet the IMO regulatory system has never really reacted to machinery failures. By far the most famous tanker machinery failure is Amoco Cadiz, in which a steering gear failure resulted in a VLCC's grounding and eventually spilling 267,000 m3 of

[1] The situation with respect to spillage is rather different. According to FSA practice, averting a ton of oil spillage is worth $60,000. Suppose you have a tanker RCO costing a million dollars per ship aimed at reducing spillage. The installed cost for the fleet will once again be 5.3 billion dollars. To survive the cost benefit analysis, you have to be able to argue that your RCO will avoid 83,000 tons of spillage in a 20 year period. This is only about 6% of all the oil that has been spilled from tankers over 10,000 dwt in the last 20 years. To put it another way, if you came up with an RCO that eliminated all tanker oil spillage, as long as it cost no more 14 million dollars per ship it should be mandated. The only way to sell any real safety measure is to claim it will reduce spillage.

crude, the fourth largest tanker spill of all time. The regulatory reaction was to mandate segregated ballast something that had absolutely nothing to do with the AMOCO CADIZ.[2] The regulatory reaction studiously avoided even looking at the possibility of twin screw, which properly implemented would improve overall machinery reliability by at least a 1000-fold. The CTX CDB claims twin screw would probably have made a difference in 325 tanker casualties involving 206 deaths and nearly a million tons spilled as Table 1 shows.

Table 1: Summary of Twin Screw RCO field in CTX Casualty Database

	1960 On			1995 On		
TS Help?	No.	Killed	Volume	No.	Killed	Volume
Probably	218	194	460,091	170	37	5,563
Yes	107	12	508,218	80	6	12,466
Possibly	74	78	239,035	33	27	55,297
TOTAL	399	284	1,207,345	283	70	73,327

As far as I know, twin screw for tankers has never been seriously investigated at the IMO.

Bulk carrier strength

Since 1970, there have been 1,875 crew killed in 203 bulk carrier structural failures or probable structural failures. The only real reaction to this prolonged string of tragedies came as a result of the DERBYSHIRE loss, and then only after a 20 year battle by the families of the dead crew to determine the cause of the sinking. Throughout this period, the official "reaction" was the loss was an Act of God (bad weather) or a crew mistake. When ROV surveys and detailed analyses revealed that the basic design of these bulk carriers (freeboard forward, hatch covers, and primary longitudinal strength) was intrinsically unsafe, the belated, grudging reaction was a very modest local stengthening, far less than that recommended by independent experts.

Inerting

Tankers have been blowing up since they were invented. In 1932, after losing 18 people in the BIDWELL explosion, Sun Oil came up with cargo tank inerting. Sun Oil reacted. By 1933, they had installed inert gas systems on all their fleet. They showed it was cheap, effective, and by the way drastically reduced tank internal corrosion. The industry and the regulatory process ignored this for nearly 30 years, in which time hundreds of lives and scores of ship could have been saved. It was not until 1974 that the USA required tank inerting and then only on new tankers over 100,000 tons. It was not until 1984, 52 years after the BIDWELL, that IMO required cargo tank inerting and then with many exceptions. In 2010, 78 years after the BIDWELL, there are still tankers the size of the BIDWELL for which inerting is not required.

Before you can disparage reactive, you must first be reactive. And we have not. One is reminded of Shaw's quip: "The only thing wrong with Christianity is that it has never been tried."

We can get by without proactive. What we must have is timely, intelligent, aggressive reactive. We can start with the AEGEAN WIND.

[2] This is not completely true. The casualty did result in a requirement for a reserve steering gear fluid tank, a very marginal improvement which has nil impact on overall system reliability.