



SRI NEWS #04 – MAY 7th 2011

by Adriano V. Autino, English editing by Gail B. Leatherwood

The responsibility for disasters is in the culture of under-estimation of risks, both local and global.

Our civilization seems to have taken a road of failure, characterized by disasters of unprecedented severity.

We had not finished crying for the 250,000 people dead in the Christmas 2004 tsunami when we had to deal with Hurricane Katrina destroying New Orleans shortly after.

Then came the 2008 hurricane in Burma with its 150,000 dead. In the same year the earthquake in China claimed 70,000 lives. In 2010 an earthquake in Haiti caused over 300,000 deaths. In 2010 the explosion of the BP Deepwater Horizon underwater oil plant shed about 5 million barrels of oil into the Gulf of Mexico, destroying the marine environment and the local economy which is based mainly on fishing and tourism.

In March 2011, following an 8.9 magnitude earthquake, a terrible tsunami struck the northeastern coast of Japan. It is estimated that 30,000 victims are dead or still missing. Even more serious damage will result from the breakage of some of the nuclear reactors in Fukushima. First of all I wish to express all my solidarity with the Japanese people in this critical hour, and my admiration for the heroes that fight with their hands to secure the Fukushima nuclear plant.

The seriousness of the nuclear Fukushima accident, initially classified quite lower than the 1986 Chernobyl nuclear disaster, has been gradually been reclassified to reach level 7, the same as Chernobyl. A frightening amount of radioactive water has been poured into the Pacific Ocean. The radioactive water does not cause immediate striking visual effects such as those caused by oil, but even more terrible effects that will be felt for decades to come.

It was said that Chernobyl represented the ideological bankruptcy of the Stalinist Soviet regime and its ideology, nominally focused on the future and progress, but in reality careless of human life. Personally I was and still am in total agreement with that interpretation. A low-quality ideology produces low-quality science. The low quality of science brings with it, as an inevitable corollary, unacceptable risks to those who should be the main beneficiaries.

If this was and still remains true for the old-fashioned Soviet nuclear power plants, kept working in defiance of every principle of security of the population, it is certainly true for the Gulf of Mexico in 2010 and for Fukushima in 2011.

For twenty years the Western people have been lulled into the illusion that liberalism without rules, as ideology, was much higher than the so-called real socialism of the obsolete Eastern European bureaucracies. In light of the events of the first decade of the 21st century, we must realize that it was an extremely dangerous fairy tale because it led our society to go happily to meet appalling disasters, the pace of which seems to be intensifying. Neither *utopian socialism* nor *utopian liberalism* exists in the real life. In real life we experience pitiful caricatures of utopias --*real socialism* and *real liberalism* --ideologies of such low quality that one wonders how we can repeatedly be so stupid and keep on voting for Utopia, then accepting what a quite insufficient political personnel is dispensing to us in reality.

I resolve to write only now, more than one month after the Japanese earthquake, because-- I can't hide it--I was appalled by this event and by the terrible underestimation of the risks that such a catastrophe reveals.



In fact, if we look at all of the disasters so far mentioned in this brief reflection, both the natural ones and those generated by human activity, we realize that they are characterized by a common element: *a total lack of any risks analysis and risks mitigation*. Many variables may of course be included in this regard. Poor countries, like Haiti or the areas affected by the tsunami of late 2004, have little possibilities to analyse and mitigate the risks. Science costs, and countermeasures to mitigate risks cost even more. For millennia our species risked its fate with its experiments, but perhaps never before has the species risked total annihilation due to the lack of, or poor, risk assessment.

I am not talking about the so-called "precautionary principle," in whose name man would probably still live in caves pondering whether or not it is prudent to try to *artificially* light a fire. We are discussing a still young science -- risk management -- which has seen the light only in the latter half of the past century, mostly to meet the anxieties of some insurance agencies. Since then it has been extended to the field of investments, and later to the design of aerospace and defence. Methodologies like FMEA / FMECA (Failure, Mode, Effects Analysis/Failure, Mode, Effects Criticality Analysis) were also developed for the systematic analysis of *all* the possible failures of systems and their spread to connected plants and the surrounding environment. The first risk assessment and management standards were born only in the 90s. Such standards, similar to the more known ISO quality standards, (International Organization for Standards) paved the way to risk management in other industries and infrastructure such as energy, food & beverage, and transportation systems.

Thinking about British Petroleum, it appears quite strange that the risk of breakdown of an underwater plant, operating at 1500 m depth, had not been properly evaluated, and that, in 2010, they were happily drilling in a situation where the risks of failure were not covered by either appropriate counter-measures or recovery procedures. We should be even more concerned, thinking that the public was totally unaware of such risks until the Deepwater Horizon plant exploded, how many other unknown high risk activities are we exposed to?

Thinking about Japan is even more shocking. In fact, Japan is certainly not unaware of risk analysis and management, considering that the best seismic technology on the planet was developed in that country. Let's just think what would be the human toll of a 9 degree magnitude earthquake on any other region of the globe! The world had to learn this month (or refocused on the concept that we learned in school one day long ago) that the Japanese people are sitting on the intersection of four tectonic plates. The first thing you wonder is: How could they build more than 60 nuclear power plants in an area of such a high seismic risk? In the case of BP, how did they drill 1500 meters under the sea if they didn't know how to manage a possible failure of the tubes at such a depth?

Such questions, to us who do other work, appear in all their enormous absurdity only *after* each disaster. But to the policy-makers and the designers charged with providing electrical power for a large industrial country (and what an industry!) such as Japan, this huge risk could not be unknown. Yet that the nuclear fission power plants have this *little problem* of disposal at the end of their life cycle is problematic, just to be fair. Deciding to place some sixty nuclear plants on a highly seismic area is a bit like inviting the devil to a cheerful picnic in the countryside.

BP management boasted to look beyond oil when they coined the slogan "BP=Beyond Petroleum". It was supposed to be an attempt to argue on an ideological level. Japan, which developed the best seismic technology in the world--unique in all the world--is putting significant investment in space solar power, so it can hardly be accused of not having an ideology attentive to the people.

So why do they, both BP and Japan, fail? And why does humanity keep on losing hundreds of thousands of precious lives due to natural disasters, disasters caused by our activities, or a mix?

This is due to the quality of our science, and therefore, by parental extension, our ideology is not mature enough to meet the challenges presented by a world populated by almost seven billion of us. We also sin of



severe schizophrenia because we are quite capable of performing excellent analysis in different compartmentalized fields. Often, if cross-analysed, they show irreconcilable contradictions.

Thus we lack ideological maturity and an (also) holistic approach. This doesn't mean we can do without a specialistic approach, but for sure we do need a conceptual analysis of the interests of all stakeholders before proceeding with any design effort.

Just to immediately step back a good distance from some so-called remedies which are in fact worse than the disease, let me state that the remedy for low quality science is not to give up science, choosing superstition and irrationality. The remedy for low quality science is a science of higher quality. In order to improve the quality of science we should introduce massive risk assessment and management in all aspects of our society.

Working for a better quality science means also to abandon the fully immature practice of discussions based on twentieth century ideologies replacing them with a practice of serious analysis of the risks and benefits of different alternatives. Another sterile confrontation between fundamentalists for and against nuclear power is already looming in several countries, and the former are in great difficulty. To approach the matter in terms of "Yes" or "No" makes no sense; it is a pure waste of time. We should, instead, evaluate the geology and seismic characteristics of each territory and avoid building power plants in areas at risk from earthquakes. As to underwater drilling, as well as the transportation of thousands of tons of crude oil by sea on oil unsafe tankers, subject to breakage, I would support resuming drilling at great depths if and when a secure technology is available and applied. Of course, security must be properly tested, not simply claimed by super-optimistic designers.

As I said, science is the result of ideology: poor ideology leads to poor science.

If ideology is not based on sound humanist concepts, the arising choices, given the current world-wide scope of all social, economic and technological processes will put humans, or even our entire civilization, at greater risk.

Steven Hawking has suggested that the chapter of the global risk for our civilization is finally being opened and seriously developed. The risks implied by an ideology that considers the limits of the planet closed and impassable are so enormous that any risk analysis should not take long.

The plan for risk mitigation? The colonization of our solar system is the only sure way to ensure our survival, and this must start with the unavoidable first step of true development of space—lowering the earth-to-orbit cost!

Aim High! Ad Astra!

Adriano V. Autino, SRI, President

A handwritten signature in black ink, appearing to read 'Adriano V. Autino', written over a horizontal line.