



## Managing Quality in Architecture

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Integrating BIM, Risk & Design Process

Five steps to avoid project surprises

Michael Ellegood, P.E.

Chapter Reference 8.8

This is the full text of Mike Ellegood's Chapter 8.8 in MQIA Second Edition, including graphics.

Many years ago, as a much younger project manager, I was assigned to manage a major long span bridge project across a major river in Louisiana. I was newly married, kid-free and living in rural Louisiana. My wife and I fell into a group of pilots that flew off of a grass strip in this bucolic area of the deep American south. In short order, we took up flying.

Our instructor, a former Air Force fighter pilot taught us that flying was essentially safe but very unforgiving. On top of this, he trained us that a safe pilot was always managing risk. Up in the air he would start by saying "You just lost power, where are you going to land?" We learned to always be on the look out for a safe place to put the plane down. When we got adept at pointing out landing places, he would then pull power and we would have to set the airplane up for a safe approach. Usually when we were established on a stable final approach, he would restore power and we would fly merrily off into the ether.

This training came in very handy in our aviation avocation, on one occasion, my wife was setting the airplane up for a landing and the engine quit because of water contaminated fuel. Her previous training made this a non-event. She calmly continued her approach and landed "dead stick". On another occasion while flying over the mountains of northern New Mexico, we had smoke in the cockpit – an electrical fire caused by a malfunctioning generator. We simply shut down the electrical system, located the nearest airport and landed the aircraft sans electrical. (I removed the generator, found that an internal wire was broken and shorting against the frame of the generator. I repaired it with a borrowed soldering iron, and went on our way).

The point of all this is, in aviation, there are a few common causes of a so-called "Inflight emergency". A good pilot learns what they are and learns to manage them by eliminating them and/or mitigating their impacts on the flight.

This same philosophy and approach can be applied directly to project risk management. Normally, usually, most of the time, as a general rule, cost overruns can be attributed to just a handful of causes. In my chosen field of transportation project design these causes are:

- ❑ Inability to obtain rights of way on time (*Right of Way*)
- ❑ Inability to clear utilities, particularly if a railroad is involved (*Utilities*)
- ❑ Inability to obtain permits, particularly environmental (*Permits*)
- ❑ Public/political acceptance (*Public/political acceptance*)
- ❑ Underground surprises. (*Underground Surprises*)

The poster child for this point is the current high cost, high visibility and highly important attempt by California to build a high-speed rail link between Los Angeles and San Francisco. Approved by the voters by a nearly \$10 billion bond initiative in 2008, the project was sold to the voters as a project that will whisk riders between these two major cities in just 2 and a half hours at a cost competitive with cheap airline fares and it was way sexy to boot. The project was started in the largely agricultural central valley, a segment thought to be relatively complication free, (as compared to getting through the mountains surrounding LA or through highly developed areas surrounding both cities),

According to an article in the Los Angeles Times, the first 29-mile segment near Fresno was let in 2013, reportedly at \$1 billion, well below the initial estimates for this segment. The contractor had a reputation among engineers for winning projects by bidding low and then filing numerous claims.



In any case, the saga continues. When Tutor Perini mobilized, and started construction, several things happened:

1. The State had failed to obtain all of the rights of way, construction could not proceed, Tutor Perini was delayed and construction claims resulted (*Right of way*).
2. The utilities were not where the utility companies said they were. Thus more utilities needed to be relocated than originally anticipated resulting in more delays, increased costs and more claims. (*Utilities*)
3. The freight railroads located adjacent to the HSR alignment are considering filing claims for interference with their operations. (*Utilities*)
4. A one mile segment of a City of Fresno roadway was originally planned to be relocated by some 25 feet. But adjacent business owners protested wanting the road to be moved behind their businesses at a significant additional cost (*Political/public acceptance*)

At this point, the \$1 billion dollar initial segment has changes estimated to exceed \$400 Million. A 40% construction cost growth. The entire project now appears to be a giant sink-hole of taxpayer money.