Structural Reliability
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Lecture –244
Target Reliabilities (Part - 07)

The next example we look at is from the end of that decade the draft mob classification guide brought out by the American Bureau of Shipping. The mobile offshore base was a novel concept it was a floating naval base and as a structural system it had no precedence. So, calibration was simply not possible.

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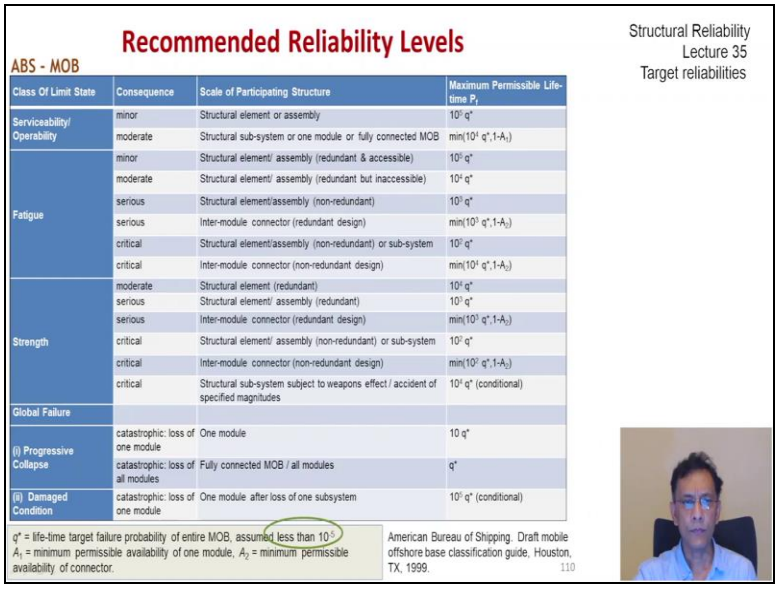

So this is the structure of the various target reliabilities that was proposed. So, we see that several classes of limit states were considered about five of them serviceability or operability and then fatigue strength and then two global failures one of progressive collapse in the other of damaged condition. Now with each of these was matched a set of consequences that you see in the next column. So, we see about five consequences minor moderate serious critical and catastrophic.

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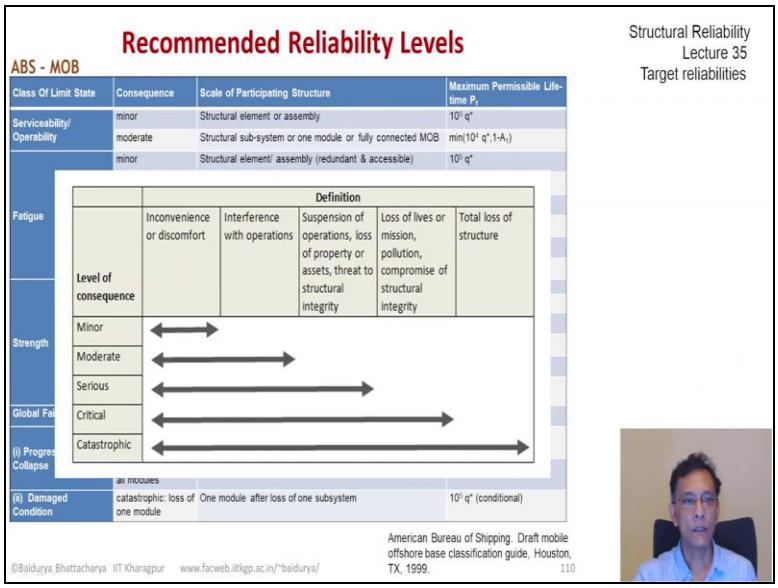

So, these were defined in terms of the losses or obsession of service. So, the first two the minor and moderate are mostly of a serviceability type. So, inconvenience and interference with operations and then we have the more serious safety class one type situations which is serious and critical which is a loss of property threat to structural integrity and then pollution and in fact compromise of structural integrity and then the total loss of structure is the catastrophic level of consequence.

So, just like DNV had this guide also considered the effects or lack of redundancy? So, you see several redundant or non-redundant whether accessible or not those things were also considered and with all of those the maximum permissible lifetime failure probabilities were defined the it is interesting to note that the system target reliability over the entire life was given in terms of one parameter q star, q star was the maximum allowable failure probability and that had to be 10 to the power -5 or less.

So, and based on that; all the other reliabilities or other permissible failure probabilities were derived. So in some sense these reliabilities were a little more stringent than that proposed by CSA and DNV and presumably because this was not only a novel structure but had other consequences of failure beyond loss of life beyond pollution and had military implications.