Structural Reliability
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Lecture –88
History Definition and Scope (Part - 06)

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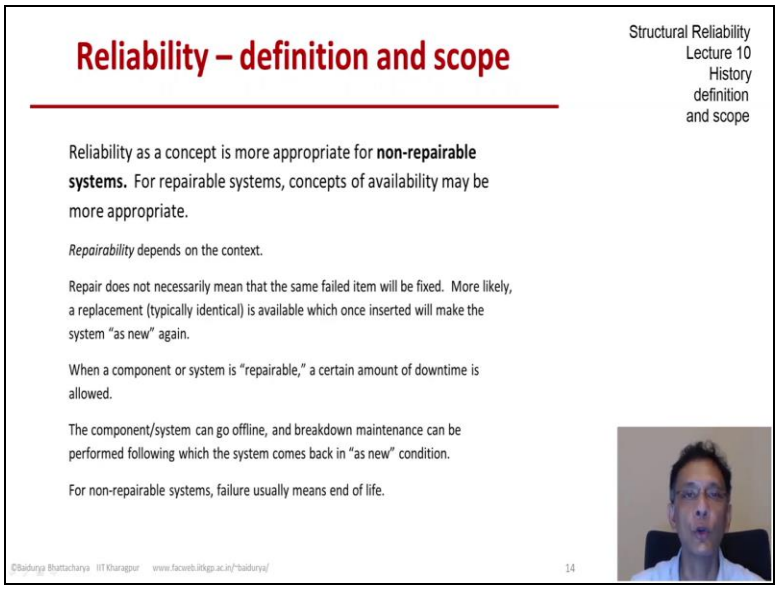

Talking about the definition and scope of reliability it is very important to understand the concept of repair ability. It is a technical term it does not mean ah performing maintenance for example on a structural system. First of all the concept of repair ability depends on the context, context of use the same item can be considered repairable in one situation and completely non-repairable in another.

So, it does not mean as I said that the item can be fixed it can be maintained and put back to use it basically means whether the item can be replaced by typically an identical and completely new version and put back into service. So, when a component or a system is repairable it basically means that it can be taken offline and the replacement can be undertaken and the item can be put back into service.

So, obviously a structural system is not a repairable system it is a very good example of a non-

repairable system because for non repairable systems failure usually means end of life. So, later on we are going to look at all the ways that a structural system is unique one of them being is a structure is non-repairable in nature in the context of reliability.

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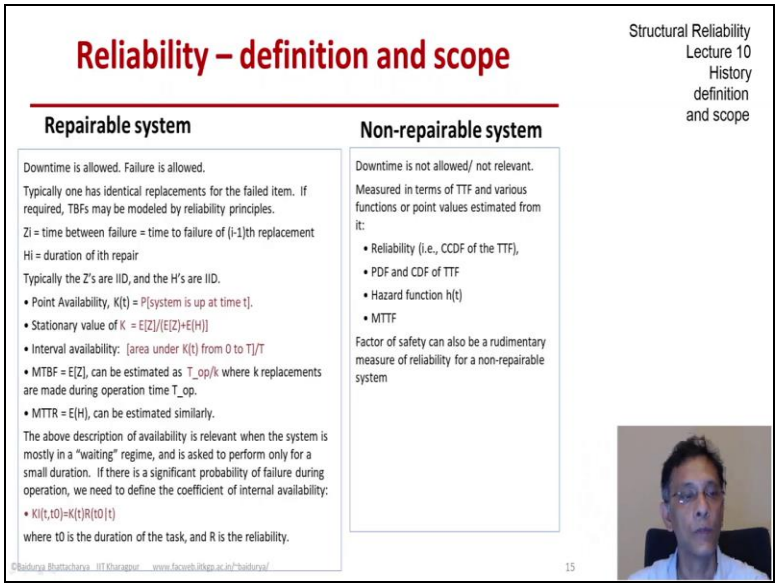

Now so just to make sure that we understand the differences uh here there is a comparison for repairable system. As I said downtime is allowed failure is allowed you just replace the item with an identical new counterpart. So, there is a supply of replacements the measure of performance satisfactory performance of a repairable system is not reliability but we use the concept of availability. So, there is point availability there is stationary availability there is interval availability.

You will find also the terms mean time between failures and mean time to repair occurring commonly when we are talking about availability of repairable systems. On the other hand for non-repairable systems which is what we are going to study the concept of downtime is not relevant we can look at the time to failure and various metrics coming out of time to failure such as reliability the CDF, the PDF of the time to failure random variable the hazard function including the mean time to failure.

But the point to note is that the concept of availability is not relevant for a non-repairable system. So, we are going to stick to reliability of non-repairable systems in this course.