Structural Health Monitoring (SHM)
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Lecture - 04
Necessity of Structural Health Monitoring - Part 2

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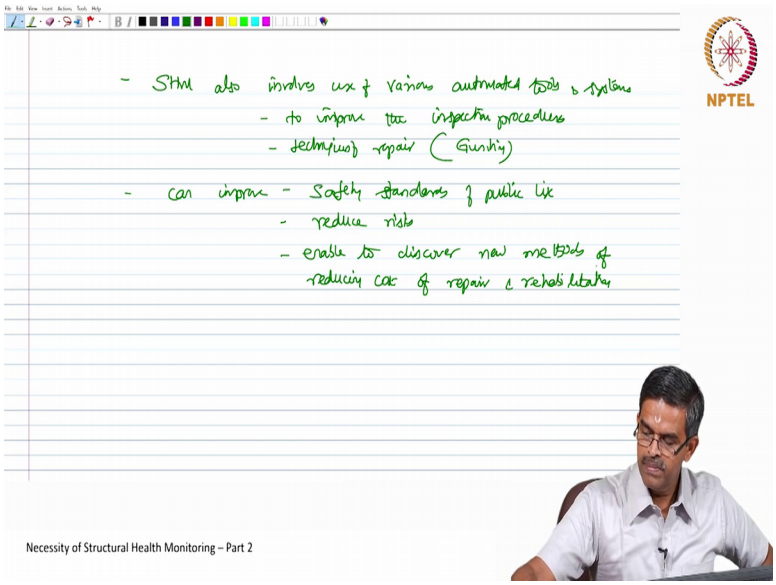

Further Structural Health Monitoring also involves use of various automated tools and systems, which are used to improve the inspection procedures and techniques of repair. For example, guniting can be one such naval method of repairing, which can improve or which can have a surface ill treatment of material degradation against corrosion.

So, therefore, a scientific approach of SHM can improve safety standards of public life, it can reduce risks and it can enable to discover new methods of reducing cost of repair and rehabilitation.

Having said this let us now see what are the list of major advantages of structural health monitoring.

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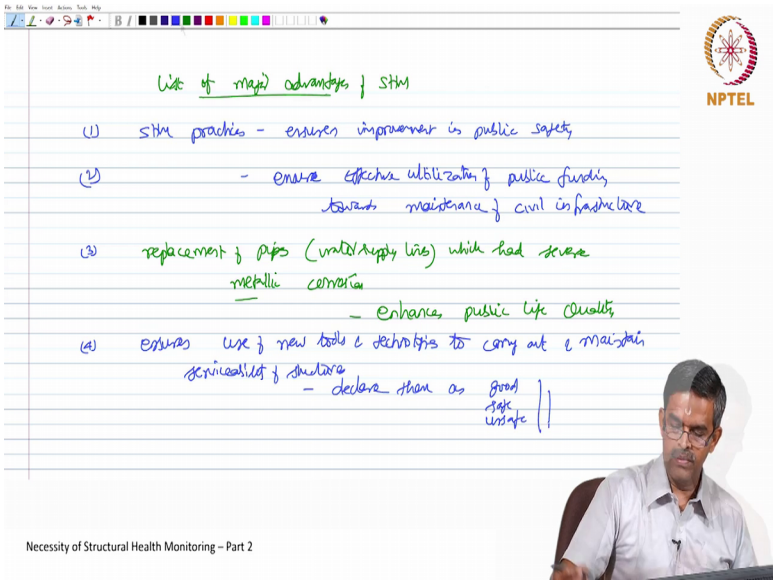

Structural health monitoring practices have many advantages, SHM practices ensures improvement in public safety, SHM practices ensures effective utilization of public funding towards maintenance of civil infrastructure of any nation. One classical example where SHM had a very serious advantage is that replacement of pipes that is water lines, water supply lines which had severe corrosion I should say metallic corrosion. So, replacement of these pipes has a preventive maintenance enhances quality of public life. It ensures use of new tools and technologies to carry out and maintain serviceability of structures and also helps us even to declare them as good, safe or unsafe.

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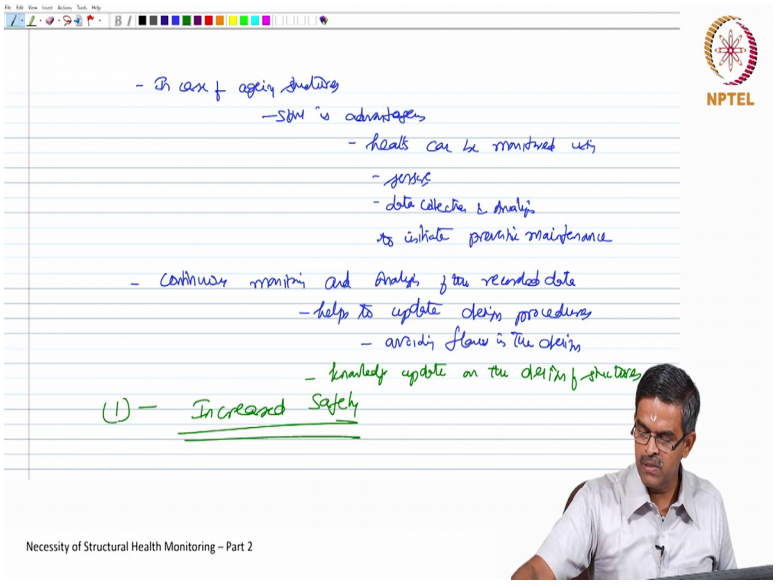

In case of aging structures SHM is advantageous, because their health can be monitored using sensors, data collection and analysis to initiate a preventive maintenance. Further continuous monitoring and analysis of the recorded data helps to update design procedures by avoiding any flaws in the design. So, it also serves as a knowledge update on the design of structures. So, all this will be bracketed under one major advantage which we call as Increased Safety; that is the first objective which one of the major advantage of an SHM.

The second advantage is it detects early risk.

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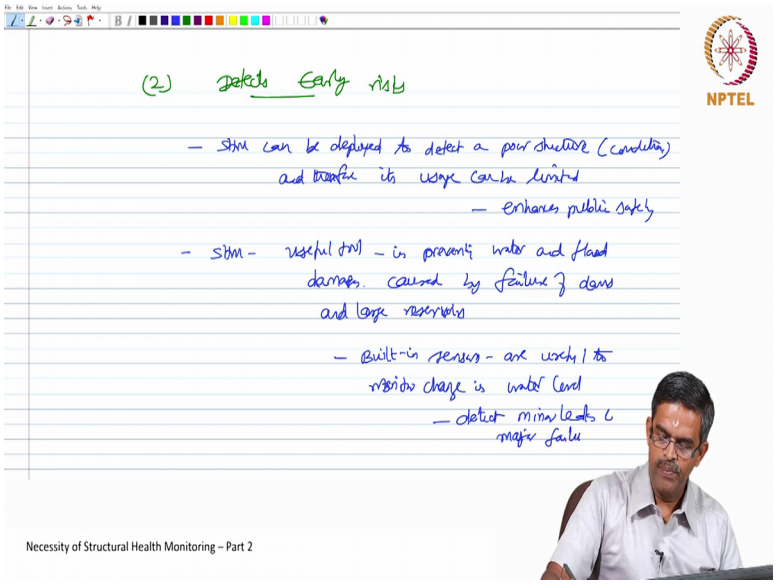

For example, SHM can be deployed, SHM tools can be deployed to detect a poor structure or its condition and therefore, its usage can be limited. So, this enhances public safety. Secondly SHM can be seen as a high useful tool in preventing water and flood damages caused by failure of big reservoirs. So, in such cases built-in sensors can be useful to monitor the change in water level, which can be used to detect minor leaks and major failure as well.

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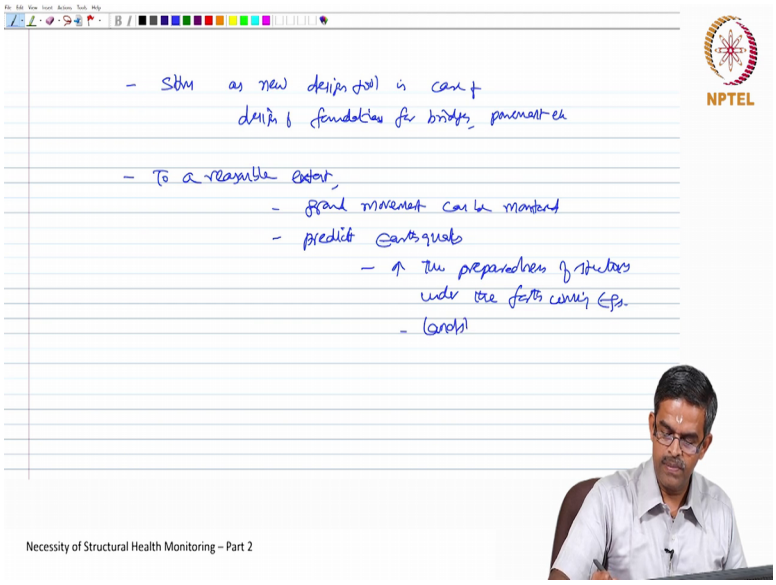

One can also use SHM as new design tool in case of design of foundations for bridges, pavements etcetera. To a reasonable extent groundwater movement or let say even the ground movement can be monitored. So, this can help us to predict earthquakes and to improve the preparedness of structures under earthquakes; under the forthcoming earthquakes not only earthquakes it can be landslides.

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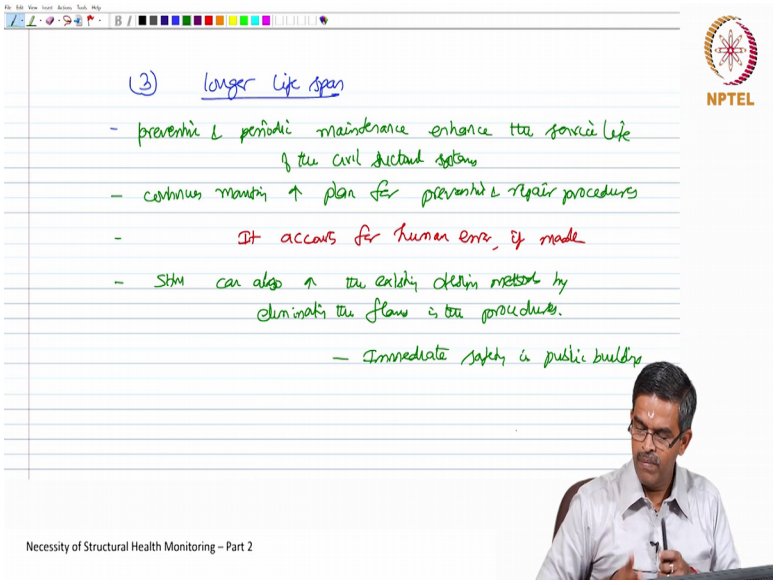

The third advantage could be, it enhances a longer lifespan for the structure. Both preventive and periodic maintenance, enhance the service life of the structure; civil structural systems. Continuous monitoring improves the plan for preventive and repair procedures, most importantly it accounts for human errors if made.

SHM can also improve the existing design methods by eliminating the flaws in the design procedures; this enhances a immediate safety in public buildings.

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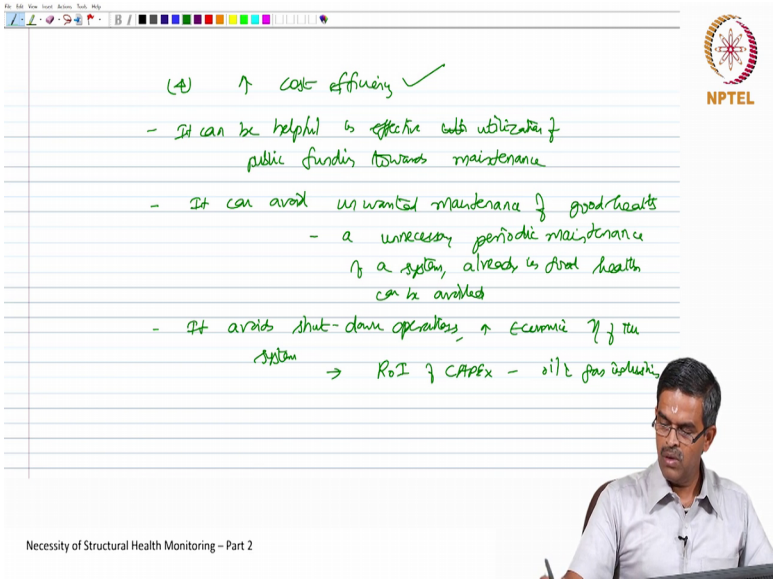

Fourthly or lastly SHM can enhance cost efficiency; it can be helpful in effective utilization of public funding towards maintenance. It can essentially avoid unwanted maintenance of structures with good health. That is a unnecessary periodic maintenance of a system already in good health can be avoided say it improves the cost efficiency. Most importantly it avoids shut down operations as explained earlier which can enhance the economic efficiency of the system. So, this can enhance the return on investment of the CAPEX money in terms of oil and gas industries.

So, let us quickly summarize what are the major advantages of processing or using structural health monitoring.

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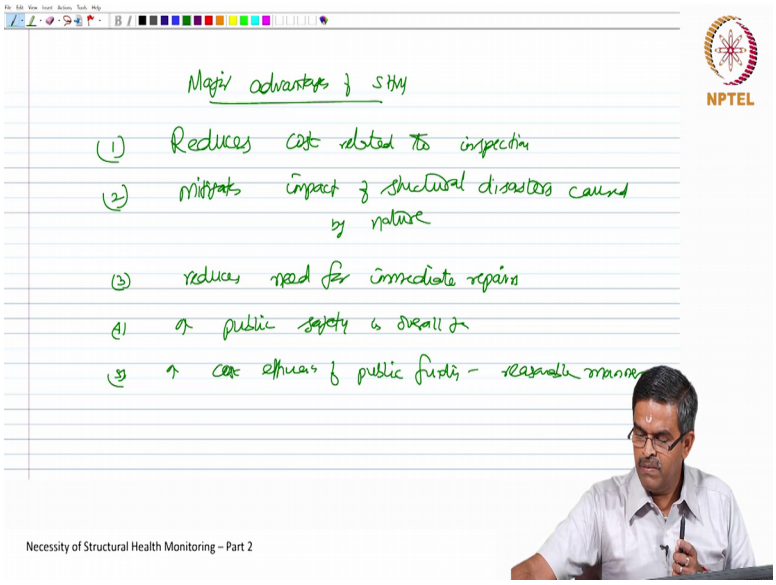

It reduces the cost related to inspection labour; it mitigates impact of structural disasters caused by nature. It reduces need for immediate repairs; it improves public safety in overall terms it improves cost efficiency of public funding in a more reasonable manner.

So, friends in this lecture we made the following observations the necessity of structural health monitoring.

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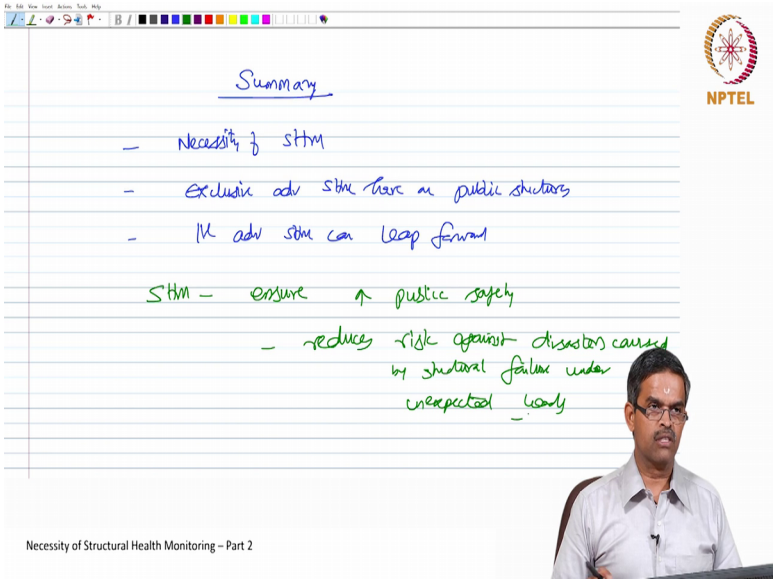

We saw what are the exclusive advantages SHM have on public structures, we also find out what are the parallel advantages SHM can leap forward to improve the public safety

and we concluded that practicing SHM will ensure improve public safety and reduces risk against disasters caused by structural failure under unexpected loadings.

Friends I hope you will go through the summary of these points once again and add more value to the discussion what we had in the classroom now. Do you have any questions kindly post them to the discussion forum for more debate and discussion servants the group of people taking this lecture at this moment thank you very much look forward for the next lecture.

Thank you bye.