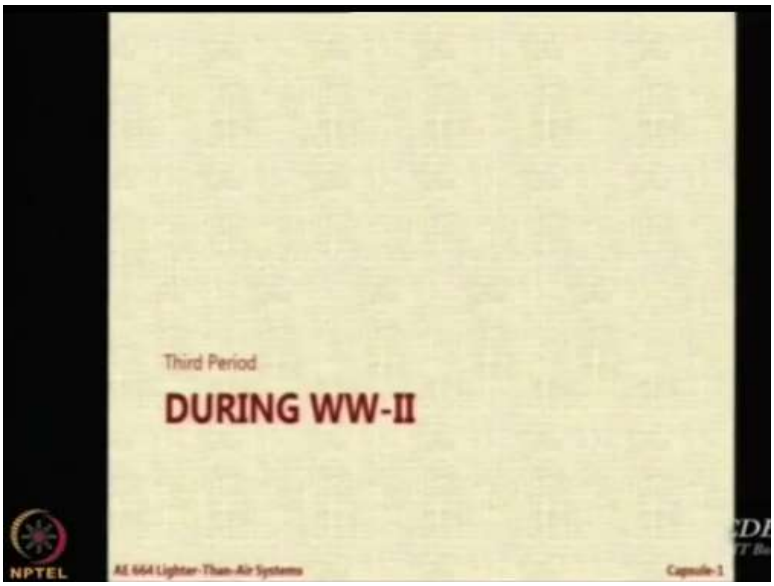
Lighter-than-Air Systems
Prof. Rajkumar S. Pant
Department of Aerospace Engineering
Indian Institute of Technology, Bombay

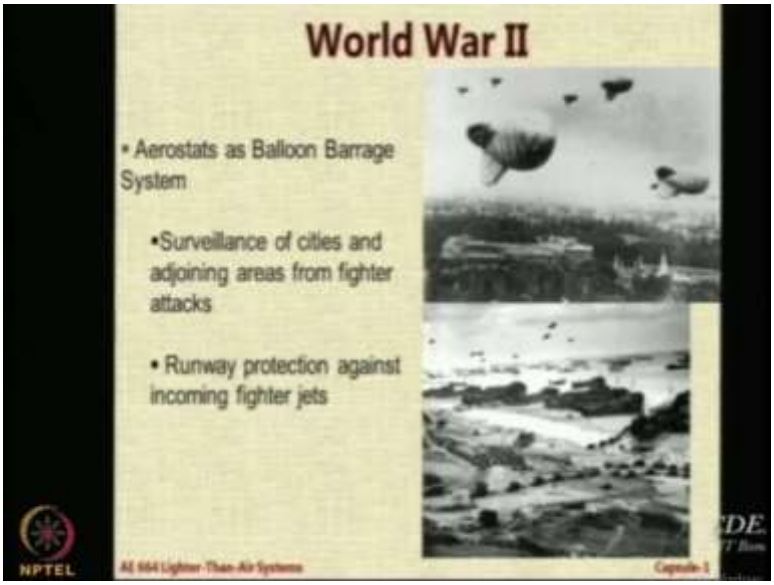
Lecture -15
Historical Developments of LTA Systems, Part-VI

(Refer Slide Time: 00:15)



So let us see now the third period during Second World War what was happening?

(Refer Slide Time: 00:20)



So during Second World War aerostats were used only mainly as a balloon barrage system, that means a cluster of balloons. So one application was surveillance protect against enemy aircraft coming into bomb your cities. So you can put many of them into surveillance but a more interesting use was runway protection. So these aerostats they were mounted with steel wires and enemy aircraft were coming into bomb the airports or the cities would get entangled in the wires and crash.

So what you do is you surround your runway with a barrage of balloons and when you are taking over you bring them down. Launch your air craft and bring them up. It is like an iron curtain around your runway to protect your own runway form enemy fire. Very successful use of aerostats system concept was attempted, not a single runway in the allied forces was attacked successfully by the Germans.

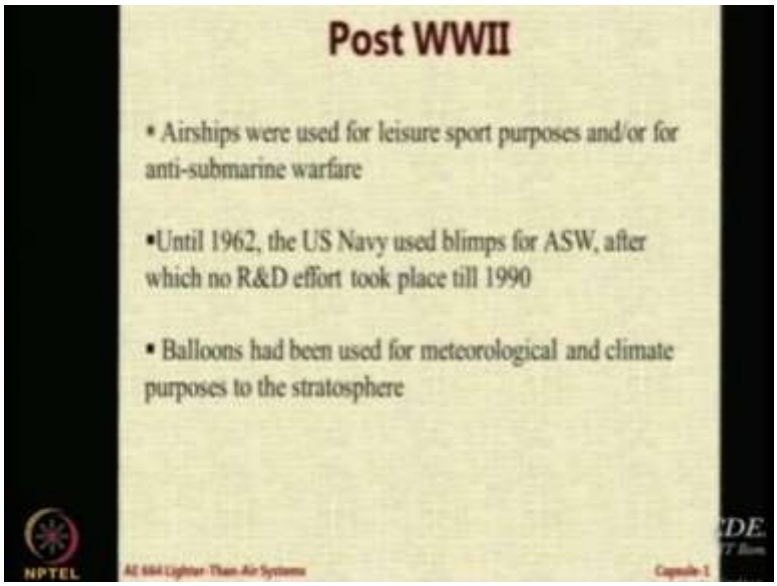
So very successful and then you heard about Normandy Innovation there was recently the function to celebrate its anniversary. So even in the Normandy innovation initial the surveillance was obtained during aerostats, you will see now aerostats are coming in a very big way.

(Refer Slide Time: 01:57)

Because airships have caught fire and become unsafe. So for passenger use they will not be applied, but aerostats or balloons which remains stationary with the tether. For non-man carrying applications, they are now being used more and more. So from 1942 to mid 80's, now this was

during the World War. Now after the World War there was a very large period of almost no activity.

(Refer Slide Time: 02:26)



So between post Second World War they were only used for leisure sports purposes and for anti-submarine warfare. The US Navy used blimps for surveillance in large number of airships used by the US Navy for surveillance purposes. But they stopped R and D effort and after that it was used only for atmospheric purposes.

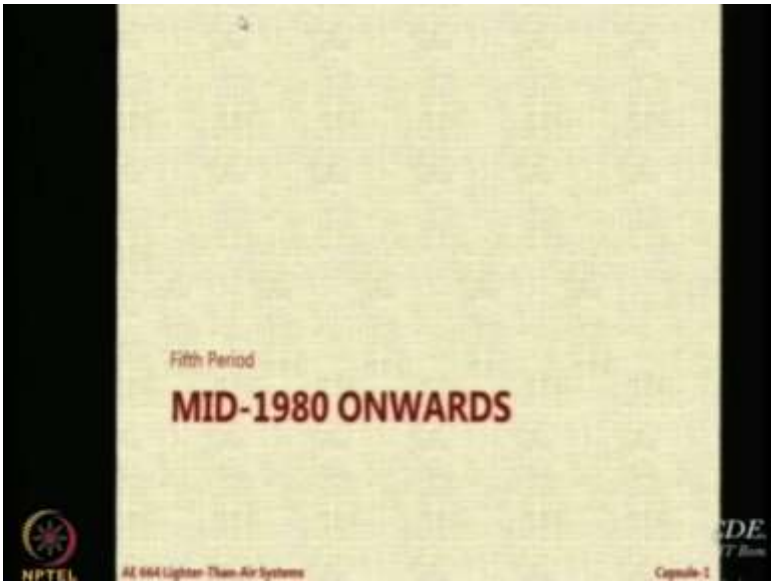
(Refer Slide Time: 02:52)

So you can see this is an airship from the US Navy deployed in 1956.

(Refer Slide Time: 02:59)

This is an airship called Los Angeles which was used by the US Navy.

(Refer Slide Time: 03:11)



And then after mid-1980 there was sudden revival. Now this is what we are most interested in. If this technology is obsolete if the technology has been overtaken by aircraft then what happened in 1980s which suddenly made it bounce back in a way. So mid-80s, so there were the contract or a requirement given by the US Navy for very long duration endurance. They wanted endurance of 30 days.

For providing the surveillance support to the airships and no aircraft was actually could meet this requirement at that time, even today the maximum endurance of an aircraft without refueling is

around 16, 17 hours. So at that point of time some airship enthusiasts they got together and they said this is a very good way of bringing back airships in between we have now developed new materials new technology.

Therefore we are able to address some of the airship limitations and this here what is the need for us to make a rigid structure, can we not have an airship which can be completely built by fabric and it will not have any metallic or solid parts inside. So a project called Sentinel was launched.

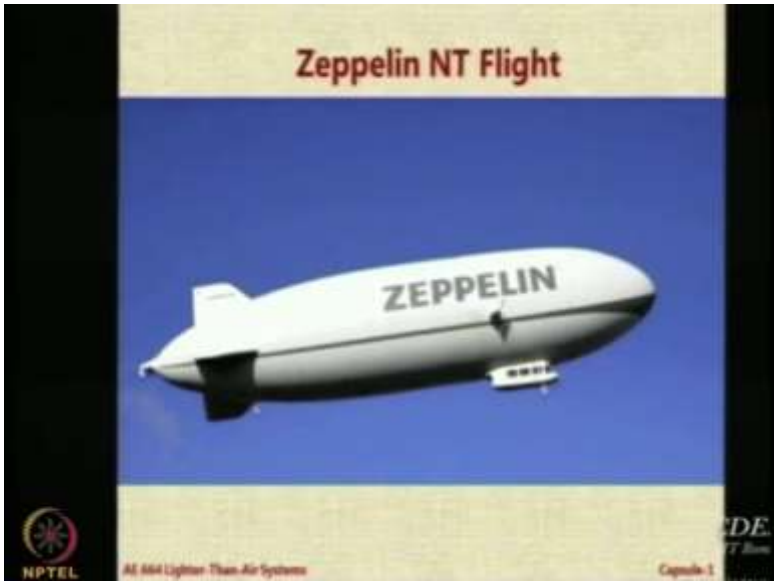
(Refer Slide Time: 04:55)

And this project was funded development funding came from the US Navy, but the project was cancelled because of financial reasons. However, one airship was made as a prototype a small scale version of Sentinel was made as Skyship was made during that project and that was purchased by a company and the company said okay, we will use it for commercial purposes. So with this, this airship came back so Skyship 600 is one of the modern airships.

(Refer Slide Time: 05:32)

We already seen one videos as Zeppelin NT that will give you an idea of how these airships are. And then airships began being used for commercial applications such as this example where which is used in Switzerland for tourism purposes.

(Refer Slide Time: 05:47)



And the latest that you have is this airship called the Zeppelin NT.

(Refer Slide Time: 05:47)

Now what is happening in the present current year scenario. This decade may be 2000 onwards. So in Afghanistan, in Iraq in many other applications where the US Armed Forces and the NATO forces are facing operation or they are carrying on their operations; aerostats and airships are being used in a very big way. The main applications are surveillance but at some places they are also used for providing internet or network connectivity.

These are the pictures of some applications of LTA systems in the current times which are ongoing. The one on the bottom right from Lockheed Martin is just a conceptual sketch.

(Refer Slide Time: 06:49)

And then there are many hybrid systems, we will have a special lecture on hybrid systems as part of this course.

(Refer Slide Time: 07:00)

And this is how a modern aerostat looks when deployed for surveillance purposes. And it gives you complete surveillance. The Indian Air Force has also installed a couple of aerostats along the western border for aerial surveillance. So we have two aerostats deployed.