DC Power Transmission Systems
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Lecture – 50
Application of DC transmission

We will try to see where do use this DC transmission or after say when I say DC transmission its assume that there is one place at which there is excess power. And it has to be transmitted to another place where there is deficit of power and these two places are separated by some distance say few 100 kilometers, so then we say transmission. Now, many a times we may be using this DC converters, I mean that is the converters that we have studied even when there is no transmission ok.

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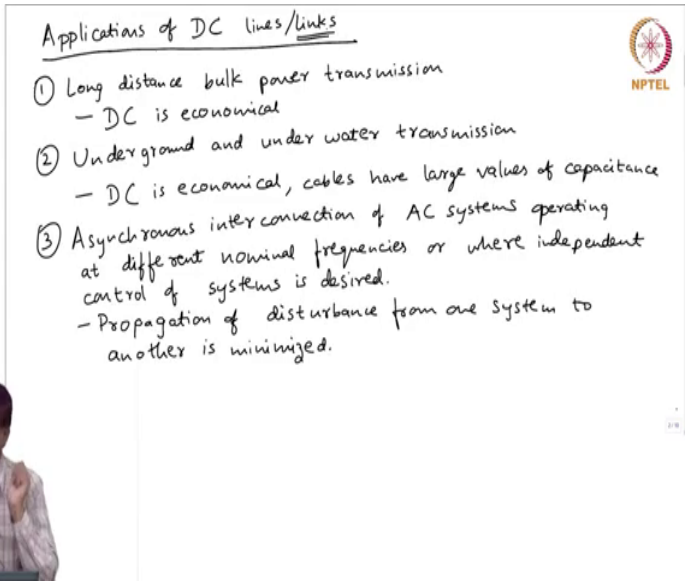

So, applications of DC transmissions lines or just lines, links or links now what is a link? A link means there is a converter which acts as a rectifier there is a converter which acts as an inverter, but there is no transmission line; that means, there just connected I mean there in the same place they are in the same place and the DC sites are connected. So we call such arrangement as a link, please note if there are two converters one acting as a rectifier another acting as an inverter without a transmission line; that means, there are close by they are in the same building say or the same place then we say that that is a DC link.

If there is a transmission line then it is called by DC transmission line. See one of the prime primary reasons for choosing anything is cost ok. So, at some point DC become economical so if I have long distance bulk transmission. So, long distance bulk power, see bulk power means a large amount of power then DC is economical.

Underground or underwater transmission sometimes one can show that DC is economical also I mean I will not, I will get into more details towards end of this course and the other reason is cables are large values of capacitance.

So, how does this affect the charge of AC or DC as I said capacitance or inductance does not affect study state in as for as DC is concerned, but capacitance can cause problems when operated with AC. And the last application is asynchronous interconnection of AC systems. So, I have two AC systems I can do what is known as an asynchronous interconnection and I mean what does this terms suggest asynchronous interconnection?

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Different frequencies, so one can say that this AC systems are operating at different frequencies. Now most of the time when we say different frequency what we mean if different nominal frequency; that means, suppose I have a system 50 Hertz and I have a another system 60 Hertz I want to interconnect this is one way of doing interconnection we call that as asynchronous.

So, different nominal frequencies actually means different rated frequencies, now many a times the frequencies are same as for as nominal value is concern, but the actual values may be different. Now it is many a times it is easier to operate the individual systems at different frequencies because control is different. See control is actually done by I mean what control, I mean who will control the frequency?

Student: Generator.

Generator there is a governor.

Student: Governor.

There is a governor so the primary control is governor ok, where independent control, independent control of systems is desired. Now in the process this will have some advantage also see suppose there is some disturbance in one AC system. And the other system is actually connected to this original system by a DC link, it is possible that the trans the disturbance is not propagated to the other system if you have a DC link it acts as a filter for the propagation of the disturbance.

See disturbance can be in the shake in the form of oscillations say at some location there is a fault and the fault is clear then you will have the oscillations. You would have studied stability right you would have studied stability of a single machine infinite bus. So, such type of disturbances can easily propagate to the entire system, but in the case of a DC link between two AC systems a disturbance originated in one system will not actually propagate to the other system thought there is interconnection in the form of a DC link ok.

So, prop this has one another advantage propagation of disturbance from one system to another is minimized ok. Now when you look at the these are the applications when you look the application one or application two there is a transmission line. Whereas when it comes to

application three many of times we do not need a line I just want to somehow interconnect so I have two points close together.

When we want to interconnect two systems and you have two nearby points we can just as well have a link we do not need a link. So the so application number three this link comes into picture ok. So, DC link can come into picture in the case of application three ok.