

ARCTIC SATCOMs

WORKSHOP “Challenge for Exploitation of Arctic Region”
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25th June 2013

Different Communications Services

- TV and Radio (basically entertainment)
- Internet Access
- Telephony – commercial / public sector & mobile/fixed
- M2M
- Trunk access / VSAT

“Who” is in the Arctic?

- Residents
- “Project” personnel
- Tourists
- In transit (ships, planes)
- Rescuers
- Unmanned monitoring stations & experimental packages

TV/Radio - Issues

- At present it seems that most of the residents are just within GEO coverage
- This means that the extra cost of serving residents beyond GEO coverage is significantly higher per person
- Quite a number of different languages are spoken within the Arctic circle
- Options for Russian / Western collaboration on satellite infrastructure may be limited by political differences

Internet Access - Issues

- Quickly becoming an indispensable way of life – adds to political pressure to improve communications in isolated regions
- There are some limited Geo services available in the Canadian Arctic
- Demand from beyond the reach of GEO is always likely to be too small to allow other satellite infrastructure to be affordable

M2M (Machine to Machine)

- M2M satellite services generally involve a service centre communicating with a large number of widely distributed sensors or receivers. Typically only intermittent contact and at low data rate e.g. monitoring environmental data, tracking wildlife
- GEO quite limited
- Major problem – electrical power – difficult to use solar cells as in other areas. Maybe wind & batteries?
- Bad weather – difficult to keep equipment snow and ice free
- Data rates often low enough to use Iridium but this is expensive

Telephony – Issues

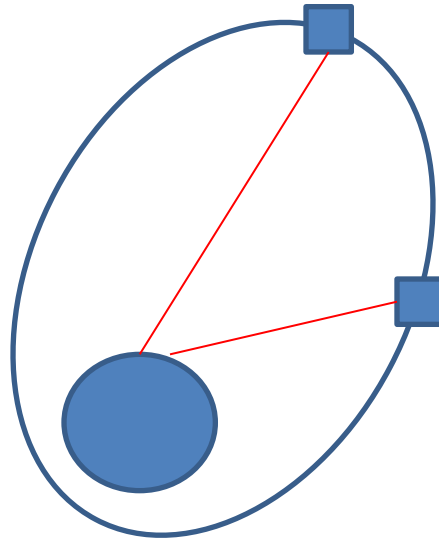
- Currently available via Iridium with a heavy phone and high charges
- Poor service from other handheld satphones
- It is an important service in an emergency
- Internet access can usually be used to provide telephony at fixed points. Extension by local RF services?

Extending GEO Coverage

- Add a few more GEOs – not very effective unless driven by non-Arctic considerations
- GEO plus microwave relays
- High Altitude Platforms
- Non-GEOs
 - HEOs
 - Inclined GEOs
 - LEOs

HEO SATELLITE Issues

- There is a need for more than one satellite so the basic cost increases
- The spacecraft is also significantly different from a GEO (attitude control, zooming, Doppler, handovers)
- A HEO could provide a multi-service platform



Sharing with Others

- HEO is highly attractive for some services in Northern Europe, Canada and Russia at latitudes well below the Arctic
- There is a possibility for Arctic services to share satellite platforms with non-Arctic services
- This is the best way to reduce costs of high quality Arctic communications
- There are possibilities for smart use of resources – perhaps more non-linear TV, avoiding immediate downloads over the internet, etc

CONCLUSIONS

- There is no easy fix
- As the Arctic population increases then so do fibre optic communications to the Arctic periphery. The growth of demand in the remote regions will not grow as much
- Key issues – try to share resources, make smart use of links and push the idea the communications is an enabler of expansion of the polar regions