N O T E

For every space programme which is in effect in United States, a failure mode analysis is carried out. Various failures on the spacecraft are expected as failures which could normally occur and which cannot be remedied by providing redundent systems. The redundency creteria can be applied to small subsystems and components which do not add substancial weight into total payload. However, redendency for major systems cannot be implimented. This in effect, results in having a spacecraft which is prone to failures which cannot be corrected. An interesting example would be a Mechanically Despun Antenna platform, similar to what was used on ATS - 3 and INTELSAT - 3. The MDA for both these satellites failed during the summer mode in which the sun was shining from above in such a manner that a thermal gradient was established across the bearing of the antenna. Further analysis of this phenomena is still being continued. However, it has been recognised that this is a thermal problem as both the satellites recovered from failure after the change in the solar inclination angle. ATS - 3 carried a pyrotechnique device which could have blown off the antenna reflector. This would have reduced the antenna

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gain by about 6 to 8 dB. But it would have mode the satellite operational. This decision to blow off the antenna reflector was not taken as the MDA life time was specified as one year for ATS - 3 and the satellite and MDA had surtived fow more than that. The decision was taken to experiment with the antenna to find out whether this was really a thermal problem or not. It can be said that this is very important consideration where any experimental satellite is concerned. This may not be true for the operational satellite. In an operational satellite a system consideration should be worked out as far as telecommunications are concerned. It is quite evident that such a consideration may not work out for the direct broadcast system. However, system margins of adequate nature should be worked out in the system design for failure mode operation.