



# APS measurements

*Victoria performs APS measurements that examine the length of time a signal is interrupted due to the switchover from active channels to back-up channels provoked by breakdowns or some kind of degradation of the signal*



*Application Note ANVASOAPS21e*



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The APS (Automatic Protection Switching) mechanism allows active channels in which there have been breakdowns or the signal has been degraded in some way to be switched over to back-up channels previously set up in the multiplexing section.

The length of time during which there is a disruption to service due to this switching from one channel to another is limited and can be measured using Victoria.

## PROTECTION METHODS

There are a number of different ways of providing protection through the use of back-up circuits, as defined by ITU-T recommendations for SDH networks. Two of the most important are:

- a)** protection of SDH paths, including:
  - protection of multiplexing section (line)
  - dedicated protection of multiplexing section (ring)
  - shared protection of multiplexing section (ring)
  - protection of virtual container (line)
- b)** connection protection for SDH sub-networks

These methods all use a protection channel and as a result each of them can use the same mechanism to measure how long it takes for the APS protocol to come into action.

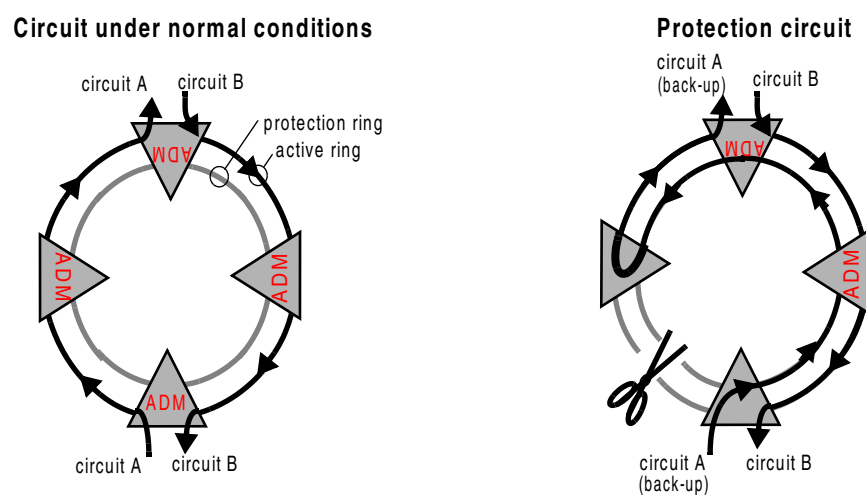
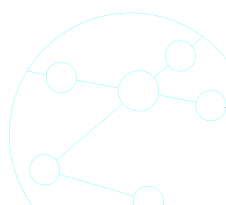


Figure 1

Dedicated protection



## APS MECHANISM

Automatic Protection Switching (APS) is a way of managing the protection of the multiplexing section. This protection is provided by back-up channels that take over from active channels whenever a problem is detected. The time it takes for the network to switch over from the active channels to the back-up channels is known as *Disruption Time*.

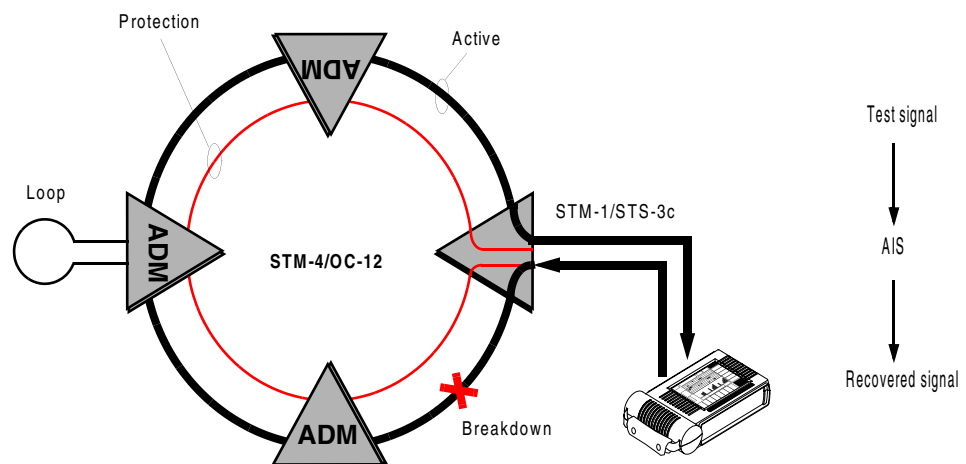


Figure 2

Measuring disruption time

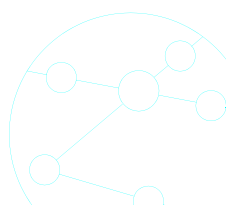
### Activating the APS mechanism

Automatic protection switching (APS) must always be activated when the following events are detected:

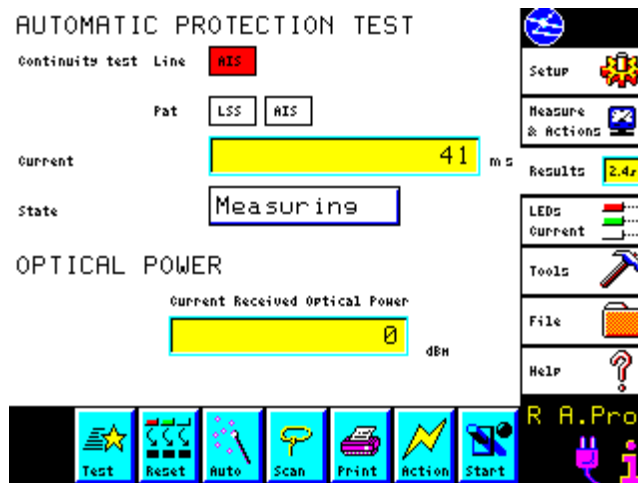
- Loss of signal (LOS)
- Loss of frame alignment (LOF)
- Alarm indication signal in the multiplexing/line section (MS-AIS/AIS-L)
- Error rate beyond certain thresholds

### Alarm indication signal (AIS)

An alarm indication signal (AIS) appears in the circuit under test when the switchover from service channels to back-up channels takes place. Recommendations such as ITU-T G.841 and ANSI T.105.1 state that this signal must last no longer than 50 ms, and a simple way of checking that the APS mechanism is working properly is to measure this time



using Victoria and confirm that it does not exceed the values specified in the recommendations. □



Figure

3

APS results screen



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