

Andøya Rocket Range to potential customers:

“Bring your payload – we’ll launch it!”

This is the slogan the Andøya Rocket Range is using to help widen their customer base. If you want to launch sounding rockets or balloons or if you want to carry out an experiment through ground based instruments, the Andøya Rocket Range (ARR) in many cases will be able to help. Since 1962, more than 700 different rockets have been launched from the site, which has also handled balloon campaigns and other types of research programmes. In step with its technological advances, the station has been developed into a research establishment that can offer an array of facilities and services to visiting researchers. Moreover, the station’s facilities are also being used to an increasing degree for different types of education programmes.

Located on one of northern Norway’s large islands, the impact area covers a large expanse of ocean. The area’s location and the ability to launch sounding rockets to high altitudes are of considerable interest to those involved with space research. The station is thus in an enviable position to carry out research programmes within this field, not only with sounding rockets, but also with such other facilities as the Alomar (Arctic Lidar Observatory for Middle Atmosphere Research) and several types of radio-based and optical ground-based instruments.

To further increase research potential, the station can launch sounding rockets and balloons from the Svalbard archipelago.

Launching possibilities

The first rocket to be launched was Ferdinand I, named after a bull which once grazed in the launch area, known then as the Bull Stall. The 700 or so rockets launched subsequently were mainly used to study the ionosphere and the upper and middle atmosphere. ARR offers complete launch services, operational data acquisition, recovering and ground instrumentation support. The base has several launch pads for meteorological and sounding rockets. The largest is the U3, a pad that can handle scientific rockets up to 20 tons. A temperature-controlled service building affords suitable ambient conditions for rockets and payloads in preparation and to countdown a few minutes before launch. All services include recovery from the sea, where ships are used to recover payloads from the Norwegian Sea and bring them to Andøya as recovery port.

The town Andenes with the launch site under the mountains in the background.

Photo: ARR



Launching from SvalRak.

To facilitate study of the dayside polar cusp, cleft and cap, ARR established in 1997 the SvalRak launch site in Ny Ålesund at Spitzbergen. From this pad, at 79 degree North, rockets of up to three tons can be launched. The high latitude and geomagnetic interesting phenomena make it an ideal site for scientific exploration of the dayside aurora and processes in the magnetospheric boundary layer. SvalRak has a sheltered launch pad, with separate preparation and integration facilities, while a mobile telemetry station provides telemetry services. In

spite of its proximity to the North Pole, Ny Ålesund boasts most facilities and communication with the rest of the world almost daily.

A typical campaign.

Years of research, preparation and fine-tuning are needed prior to launching a sounding rocket and, in many cases, researchers will remain at the site after

the launch interpreting collected data, and writing reports at the conclusion for further research. Thus, the launching of the payload is in most cases only a step along the way.

A launch campaign begins by finding a launch operator. In Europe, researchers have two excellent alternatives, Andøya Rocket Range or ESRANGE in northern Swede. That said, researchers investigating phenomena within the space plasma field would in all likelihood choose ARR. The next issue is the size

of your instrument package. ARR is able to take your instrumentation as a passenger on a Hotel Payload, if the instruments can be adjusted to the available size. A large payload, or a specific type of payload, may well need its own launcher. ARR can, however, offer launch facilities for most other purposes.

Should you choose ARR as your launch operator, ARR staff will take care of most of the practical work relative to the launch - while you concentrate on your scientific goals.

The first step in obtaining permission to launch in Norway is to apply formally to the Ministry of Trade and Industry. They will base their decision on expert opinion from the Norwegian Defence Research Establishment, which will give technical clearance to the launch campaign. When the launch period and impact area is agreed, warnings are issued to the fishing fleet, shipping, airborne traffic and others who may be affected by the launch. Areas close to the launch range are scanned by radar at the facility when the launch time approaches. For the impact area, however, warnings suffice.

The time of launch is dictated by two main conditions - scientific conditions for the researchers and ground weather conditions. The conditions in the atmosphere are studied with different types of instruments on the ground, among them the Alomar installation on the mountain overlooking the launching range. When the atmospheric conditions are perfect, the go-ahead for the launch is dependent on the weather. Wind conditions are crucially important for the launch, and regular wind measurements are carried out with balloons and the 100 metre tall wind mast at the launch pad. The Operation Manager at the rocket range takes the final decision on the launch. As the countdown start, the recovery ship sails to the impact area, and is ready in position by the launch. Data from the onboard instruments is continuously transmitted to the ground telemetry receiver stations during flight. Recovery will depend on the value of the payload.



From the operation room.

Hotel Payload.

To reduce launch costs for small scientific payloads, ARR have developed the Hotel Payload concept. This is a standardised payload structure with a common service section for different types of scientific instruments. If the instruments can be adjusted to the structure, a user can "rent-a-room" in the hotel, sharing on board space with others who wish to reach the same height and trajectory. ARR markets two variants, with 130 and 200 millimetre diameters respectively. The instruments share a common power supply, telemetry equipment, recovering equipment etc. ARR offers the hotel, the rocket motor(s), launch and recovery operations, plus all other necessary services at a fixed price. A fixed price and good service are crucial to the scientists, who, knowing that ARR can supply them, are thus able to focus their minds on the scientific preparations.



Students working with Hotel Payload, and the same payload ready for launch.

Photo: ARR

