Allan Ballard

Dr Leo Hobbis: "It couldn't have happened at a worse time"

The enigma of Nimrod

By Bryan Silcock

NIMROD, Britain's only atom-smashing machine, which was damaged in a mysterious explosion at Harwell last week, may not come into operation again for another year.

The vast experimental area around the machine, littered with huge blocks of steel and concrete used as a radiation shield, has a strangely deserted look.

It took a quarter of an hour to find somebody with a key to the room housing one of the most important experiments Nimrod has ever been engaged on. Beside the big French bubble chamber, which arrived on loan only a few weeks ago, two bored French technicians with no work to do, sat reading "Paris Match."

Worried scientists, with stiff upper lips, talk of being back at work in a couple of weeks, but when pressed, they admit it could be a year. It all depends on the outcome of the investigation of the accident now in progress.

The accident occurred on one of the two alternators supplying power for Nimrod's 7,000-ton electromagnet. If there is no risk to the other one, work will be able to start again quite soon, though. The weakened Nimrod will be able to work at only half its noraml rate.

But if the investigation shows that there is a risk of the other alternator failing as well, rebuilding the two of them could easily take a year. "It just doesn't bear thinking about," said Dr Godfrey Stafford, Head of the High Energy Physics Division.

What exactly happened? For two weeks out of every three, Nimrod had been working round the clock, and on Sunday night, everything was going normally. Two experiments were in progress.

In building R3, which houses the two alternators, the instruments showed no abnormal vibrations in the long shaft. Then, around midnight, the technician in charge heard a loud bang followed by a vicious grinding noise.

He switched off and went out to investigate.

Black smoke was pouring out from one of the alternators and the big hangar was filled with the smell of burning insulation. Even with the brake on, the 170-ton shaft, turning at 900 r.p.m., took a quarter of an hour to come to rest.

Distant engineers of English Electric, the makers of the alternators, were hauled out of bed in the small hours and arrived at Harwell early in the morning. They soon found what was wrong. An endplate, holding together one of the six pole pieces and helping to secure it to the rotor shaft, had broken, allowing one end of the pole piece to lift and chew up the surrounding stator. Rebuilding will take at least eight months.

An investigation by English Electric and the Rutherford Laboratory started at once. The laboratory engineer in charge of the machines locked himself in his room, covering sheets of paper with calculations trying to find out what happened, but the answer will probably come from a detailed examination of the damaged plate. If it turns out to be, say, a defect in the casting, which there is no reason to believe is present in the 12 identical castings on the other rotor, British nuclear physicists will let out a collective sigh of relief.

Productive maturity

But if something like metal fatigue, which would probably affect both alternators equally, is responsible, they will face the dismal prospect of being able to do no experimental work for a year or more.

"It could hardly have happened at a worse time," said Dr Leo Hobbis, Head of the Nimrod Division. For, after doubts about its conception and a difficult childhood, Nimrod has at last reached a productive maturity.

Although Nimrod cost as much as the giant accelerator at Cern, the European Nuclear Research Centre in Geneva, of which Britain is a member, it is far less powerful. This is because the Cern machine was built on an untried principle and everyone agreed that it would be too risky to build Nimrod to a similar design. In fact the Cern design exceeded everybody's wildest expectations.

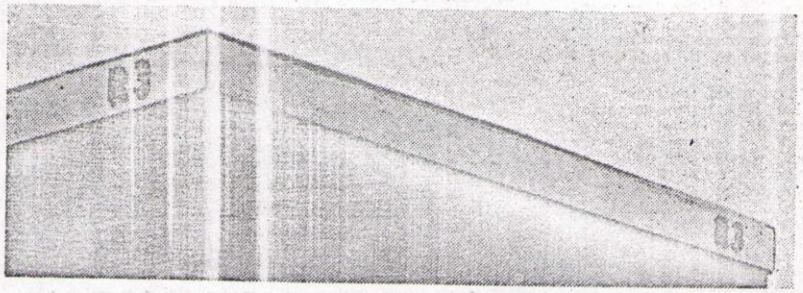
Nobody questions that the original decision about Nimrod was right when taken; they just wish it had been different.

To make things worse, there were long delays in getting Nimrod built, and then a farcical situation developed in which the new £11 million machine could be used only at weekends as there was so little money left to pay for electricity.

But, since last February, Nimrod has worked well. "We are getting 50 per cent. more particles per pulse than the design figure," said Dr Hobbis. Although some of the things that Cern can do are out of Nimrod's reach it can still do very important experiments on the frontiers of high-energy physics.

This summer there is an international conference on high energy physics at Oxford, organised by the Rutherford Laboratory. Naturally Nimrod will be the main showpiece. It would be the last straw if it is not working at the time.

There may also be some trouble over who pays for the damage. The alternators cost hundreds of thousands of pounds. The Rutherford Laboratory say the damaged one was under guarantee. English Electric neither confirm nor deny it. But they pointed out that equipment of this kind is normally guaranteed for a year. The damaged alternator had been in for 15 months.



R3—and not on TV

FOR some of Britain's scientific research workers, R3 is a reality, as well as being the name of television's fictional series about life in a Government research centre.

R3 is the name of the power house (above) at the Rutherford High Energy Laboratory, Chilton, in which one of the alternators connected to the power supply of the proton synchroton, Nimrod, was badly damaged this week.

It was at midnight on Sunday that "a serious mechanical fault," to the alternator literally brought the giant atom smashing machine "to a grinding halt" said a spokesman:

A fracture of a pole-piece component of the rotor caused the component to partially peel away under the terrific centrifugal force.

The effect was a loud clattering and banging inside the alternator and dense smoke, and damage which may eventually be estimated in tens of thousands of pounds.

It took 20 minutes to stop the alternator. No-one was injured.

Tonight's concert

Tonight's Subscription Concert will be at the Sheldonian Theatre, Oxford, not at the Town Hall as stated in Monday's Oxford Mail.