



Trust and Verify

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French nuclear testing

At 21:29:58.5 GMT on 5 September France conducted the first of its nuclear test programme announced by President Chirac on 13 June. The test took place at location 21° 50' 71" S, 138° 50' 6" W at Mururoa Atoll and the seismic event it caused measured 4.8 on the Richter Scale.

The French authorities classed this test as below 20 kilotonnes, which became reported as simply '20 kilotonnes'. Seismic data indicate that the test had a yield of some 5–15 kilotonnes.

The test was the 193rd carried out by France; the 127th underground.

Test programme

It is becoming clearer that three of the planned series of tests have specific purposes.

The most important test for the military authorities will be the final certification of the TN-75 warhead which will be used on *Le Triomphant*, the new ballistic missile submarine which is due to enter service in the coming months. It is not clear whether this will involve a full-scale test of the warhead (believed to be some 100 kilotonnes in yield) or simply a test of its initial stages.

Discussion of this has been avoided as some officials believe it lays France open to allegations that it is using the tests to develop a new warhead design. The reality seems more prosaic.

Just like the other Western nuclear-weapon states, France has a complicated bureaucratic system in place to certify the safety and suitability for service of defence equipment. As far as can be gathered, the certification process for nuclear warheads requires that a production warhead be selected at random before entry into service. This warhead is then subjected to certain simulated conditions of service and detonated as final proof of confidence in the certification system.

The problem for the French authorities is that while an alternative final certification procedure can be worked out, the time taken to arrange this would delay the entry into service of *Le Triomphant*.

Critics have pointed out that now French missiles have been detargeted and France officially has no enemies that it needs to 'dissuade' with the *Force de Frappe*, a few months delay would not damage French national security.

Two tests appear to be to check some form of initiation sequences, which apparently have proved unreliable in French warheads.

The rest of the test programme is said to be focused on assisting the development and refining the accuracy of computer simulation and other alternative technologies for maintaining nuclear weapons. However the results from these tests may assist future weapons development.

It is possible that if the early tests perform as expected by the designers, the political benefits of curtailing the test series will outweigh the technological benefits of carrying out the last few. President Chirac hinted, just before the 5 September test, that the full programme may not be carried out.

Other than the TN-75 certification test, the other tests appear likely to be under 20 kilotonnes.

Environmental concerns

The difficulty in assessing the impact of testing at Mururoa and Fangataufa is that there is no systematic environmental data available. Furthermore, although independent scientists have taken samples at and around the atolls, sampling has only been carried out within limitations determined by France's authorities and over a short time.

France has indicated that after the completion of the test series independent scientists will be able to conduct environmental surveys of the two atolls.

Most of the concerns in relation to the environment are closely linked with concerns about the geology of the atolls.

Geological concerns

The islands of Mururoa and Fangataufa are extinct volcanoes, the atolls being the product of layers of coral built up on the rim of the ancient crater. Tests are detonated in basalt, a relatively strong and hard volcanic rock which formed the main bulk of the volcano. Given complete and correct knowledge of the subsurface rocks, a properly-conducted test incurs only a long-term hazard. The rock that is melted by the blast cools to form a glass, trapping bomb debris within it. Radiation is unlikely to escape from this, at least within the next few centuries.

At Mururoa, however, the short-to-medium term risks are more severe than a land test site, simply because of the proximity of the open sea around the submarine volcano. Unexpected, and possibly unmeasurable, geological conditions, such as weaknesses or fractures in the basalt, may cause the explosion to extend sideways and open new fractures through which sea water may pass and leach out radioisotopes. Tests in 1977 and 1979 are believed to have caused landslides at Mururoa.

The presence of numerous old explosion sites in such a small area makes this situation technically harder to handle. Each nuclear test creates further fractures in the basalt which may stretch for some distance from the explosion. For example, a 100 kiloton test, which may be used to certify the TN-75, could cause cracking in basalt up to a distance of 1,000–1,500m.

Dr Roger Clark, seismologist at Leeds University and VERTIC consultant, has calculated that a 150 kt test in these geological conditions would cause an event measuring around 6 on the Richter Scale and would produce a cavity of about 100m in diameter. The zone of fractured and deformed rocks (which occur after all underground nuclear tests) could be as much as about 1,500m in diameter. The greater energy output from such a test would require it to be carried out some 400–500m deeper than the test on 5 September. Calculations of a 100 kt test are only 15 per cent less than those for 150 kt.

Dr Clark has noted that there are few areas left on Mururoa that will accommodate such a test. It is therefore likely that a test of this magnitude would be conducted at Fangataufa because, although it is smaller, France has only conducted eight underground tests there.

Furthermore, research has been conducted by the Institute of Oceanographic Sciences (now located with the Southampton Oceanography Centre) with sonar devices to produce three-dimensional computer-generated images of submarine landscapes around Hawaii and the Canary Islands (volcanic islands with characteristics similar to Mururoa and Fangataufa). The Institute's director, Dr Colin Summerhayes, has stated that such volcanic islands are 'inherently unstable and may fail, given an appropriate trigger like an earthquake or a very large explosion' leading to a risk of an underwater landslide that could release radioactivity.

It is clear that all of these difficulties are appreciated by the French testing engineers. Underground testing is, after all, a fairly long-established process. Computer simulations of the explosions and their effects on the surrounding rocks are a routine element of test design. Nevertheless, Mururoa is a site which demands unusually careful preparation for each test.

Euratom Monitors

The European Commission, acting as the executive body of Euratom — the European Atomic Energy Community, have sent three inspectors, two Belgians and a Briton, to inspect facilities at the Pacific Ocean test sites. The inspectors arrived on site on 22 September.

The inspectors have been sent at the request of the environment Commissioner to monitor the environmental aspects of the testing programme. The experts will have access to monitoring devices on both Mururoa and Fangataufa atolls.

The French Government has resisted what it sees as interference by Euratom and appears to have acquiesced to the inspections without giving formal acknowledgement to their legal status.

Euratom provisions

The dispatch of Euratom inspectors comes from provisions in the *Treaty Establishing the European Atomic Energy Community*, signed in 1957, under Title Two — 'Provisions for the encouragement of progress in the field of nuclear energy', Chapter III — 'Health and safety'.

Chapter III makes no distinction between peaceful and defence activities. Article 34 of the Treaty reads:

Any Member State in whose territories particularly dangerous experiments are to take place shall take additional health and safety measures, on which it shall first obtain the opinion of the Commission.

The assent of the Commission shall be required where the effects of such experiments are liable to affect the territories of other Member States.

The Commission has, for the first time, considered that nuclear testing activities are 'particularly dangerous experiments'. Some elements within the Commission wish to be further consulted by France as there is a possibility, however remote, that the tests may affect Pitcairn Island, a British territory, some 2,000km away. It should be noted that Commission rules do not require that the British Government be concerned about possible effects.

Pitcairn Island currently has a population of 55, descended from the mutineers from HMS *Bounty*.

The French Government has responded by stating that Euratom has no role in monitoring military activities and by citing the last part of Article 84 of the *Treaty Establishing the European Atomic Energy Community* (Chapter VII), which reads:

The safeguards may not extend to materials intended to meet defence requirements which are in the course of being specially processed for this purpose or which, after being so processed, are, in accordance with an operational plan, placed or stored in military establishment.

However, this article specifically relates to safeguards only. There appears to be no other reference to defence activities in the Euratom treaty.

The Commission has given no reason as to why it should raise concerns about testing at this time other than to indicate that this is the first time that Euratom member states had themselves raised concerns. For example, the current inspection mission has been called at the instigation of the Belgian Government.

Britain, unlike France, has never carried out its testing on sovereign territory. Since becoming a member of Euratom in 1973, Britain has tested in Nevada, well away from the territories of other Euratom member states.

'European' nuclear forces

In moves designed to deflect criticism of its test programme, the French government has indicated that it could, in time, offer up its nuclear forces as a component in combined European defence forces.

However, in doing so, the Government of France appears to have overlooked its own treaty obligations and those of other states.

In addition to the obligations under the nuclear Non-Proliferation Treaty, to which all EU states are parties, the position of Germany, via whom the offer was made, is unique as it has obligations under the Western European Union treaty of 1954. These obligations were restated when Germany was unified.

Article 3(1) of the *Treaty on the Final Settlement with respect to Germany* (the treaty that was the result of the '4 + 2' negotiations), signed on 12 September 1990 reads as follows:

The Governments of the Federal Republic of Germany and the German Democratic Republic reaffirm their renunciation of the manufacture and possession of and control over nuclear, biological and chemical weapons. They declare that the

united Germany, too, will abide by these commitments. In particular, rights and obligations arising from the Treaty on the Non-Proliferation of Nuclear Weapons of 1 July 1968 will continue to apply to the united Germany.

Climate Negotiations

Last month in Geneva the parties to the Climate Convention launched into discussions on the next phase of development of the Climate Convention. Three meetings were held in succession over a two week period from 21 August to 1 September. The first was a meeting of the ad hoc Group on the Berlin Mandate (AGBM) to negotiate a protocol on emission reductions. The second and third were meetings of the Subsidiary Body on Scientific and Technological Advice (SUBSTA) and the Subsidiary Body on Implementation (SBI).

In the negotiations on a protocol it rapidly became clear that few states had any firm ideas as to exactly what level of commitments to emission reductions any protocol should contain. The EU, for example, had not held a Council meeting on this issues since Berlin and thus had nothing new to say on the matter. Those governments which had prepared positions beforehand were mainly those who had been opposed to a protocol on emission reductions in Berlin, notably the JUSCANZ Group (Japan, USA, Canada, Australia, New Zealand) which had met earlier in the USA. The JUSCANZ delegations were thus able to dominate the initial stages of the talks and took their now standard position that there is insufficient scientific information concerning climate change to be sure what to do about emission reductions and a newer, supplementary position that more information on policies and measures for emission abatement is needed too.

As a consequence the AGBM became bogged down in compiling long lists detailing who it might ask questions concerning policies and measures. Some delegations, such as the Netherlands, pointed out that there were few policies and measures that could be implemented at an international level, and that were thus worth considering in a international forum, and that domestic policies were evidently primarily a domestic concern. Other delegations, such as India, pointed out that there was not much point in examining policies and measures in the absence of an emission reduction target and that the AGBM ought therefore to consider a range of reduction scenarios first and then try to fit abatement measures to them. Nevertheless, the discussion of policies went on all week with JUSCANZ, ably supported by Saudi Arabia, arguing that the Berlin Mandate says that 'the process will include in its early stages an analysis and assessment to identify policies and measures...' which it does. The Alliance of Small Island States (AOSIS) might have argued that the Mandate also obliges the AGBM to consider their formally submitted protocol for 20 per cent emission reductions, but AOSIS did not.

Overall, the AGBM did not achieve much at its first meeting, other than writing a list and setting dates for future meetings. Setting an agreed agenda for these may be hampered by the fact that the Group still has no rules of procedure and no Bureau, primarily as a consequence of spoiling moves by Saudi Arabia prior to and at the Berlin Conference of Parties.

For many, the highlight of the week-long AGBM was when Saudi Arabia unwittingly appeared to read out the main contents of a forthcoming US intervention which had, unbeknown to the Saudis, been circulated earlier. Scurrilous rumours then circulated that both

delegations might be receiving their information from the same source: the coal lobby who were at the meeting in force.

Discussions in SUBSTA centred on who should have control of the Technical Advisory Panels (one on Technology and one on Methodologies) which it is obliged to set up by January. In essence, the OECD wanted to be ensured of a majority on the Panels and the G77 and China wanted the same. This dispute was not resolved, in spite of some able chairmanship and two evening sessions. However, certain organisational matters were decided and a set of questions which the SUBSTA wants the IPCC to answer was compiled. The meeting seemed genuinely concerned to reach agreement on the Panels and the Chairman will have informal consultations at the next AGBM meeting in October to try to come to a compromise.

The SBI really only considered organisational matters and thus needed to meet for only one day, giving its remaining, scheduled day to SUBSTA to try to reach agreement in.

The AGBM will meet again in Geneva for the week beginning 30 October. The AGBM, SUBSTA and the SBI will all meet again in February 1996.

VERTIC in the Transcaucasus

VERTIC's work in the field of confidence building in the Transcaucasus continued at a steady pace in the summer.

The Second in the series of conferences being organised in the framework of the Georgia Youth Project was held in Batumi, in the Autonomous Republic of Adjara from 19–23 July 1995.

Like the first conference, the Batumi meeting brought together representatives from a wide spectrum of Georgian society with participants from all the major political parties, ethnic groups and social forces in the country.

However this time the conference had an added significance with the participation of delegations from Armenia and Azerbaijan, as well as a representative delegation from South Ossetia. The Conference met under the theme 'Youth for Peace in the Transcaucasus' and brought together more than 130 young people from the region, as well as a stream of politicians and diplomats who travelled to Batumi especially for the meeting. Amongst them was the Deputy Prime Minister of Georgia, Irakli Mengharishwilli; the General Secretary of the Union of Georgia Citizens (the governing party), Zurab Zwania; the Head of the European Union Mission to Georgia, Ambassador Dennis Corboy; the Ambassador of the United States to Georgia, Kent Brown; the Foreign Minister of South Ossetia, Dimitri Medoev; the Head of the Youth Department in the Office of the Prime Minister of Georgia, Niko Nikolosishwilli; as well as representatives of the OSCE Mission in Tbilisi.

The Conference was opened by the Vice President of the Supreme Council of Adjara, Prof. Alexander Gobronidze. Speeches were also made by Dennis Sammut of VERTIC, as well as by Ambassadors Corboy and Brown.

VERTIC 'making an excellent contribution for peace in Georgia' — Shevardnadze

In a message addressed to the participants of the conference 'Youth for Peace in the Transcaucasus' the Georgian Head of State Edward Shevardnadze said:

You meet in Batumi to discuss a topic of great importance. The quest for peace is a hard and

difficult one. This is more so in the Transcaucasus where recent conflicts have caused the death of thousands and created hundreds of thousands of refugees and displaced persons. This apart from the economic losses that have resulted in a serious decline in the living standards of millions. I am encouraged by the fact that young people from different political, religious and ethnic backgrounds are coming together to discuss the issue of peace in the Transcaucasus. Your very presence together in this conference is in itself a positive civilian confidence building measure and should be encouraged. As the leaders of the future your deliberations will also, I am sure, be of profound relevance to the future relations between the people of the region.

Georgia welcomes your conference and its work. As a country that has suffered much from war and conflict we understand very well the value of peace and appreciate the efforts of those who work for it. In organising this conference VERTIC is making an excellent contribution for peace in Georgia and in the Transcaucasus Region. I wish your conference great success.

Georgian-South Ossetian Dialogue

One way in which VERTIC is contributing to peace in the Transcaucasus is through the promotion of a Georgian-South Ossetian Dialogue.

For nearly a year representatives of VERTIC have been patiently building a relationship with both the Georgians and the South Ossetians at various levels. The efforts bore fruit in July with the participation of a delegation from South Ossetia in the Conference. The delegation included South Ossetian Foreign Minister Dimitri Medoev, as well as representatives of various South Ossetian youth and public organisations. This was the first time in five years that a South Ossetian delegation participated publicly in a meeting in Georgia.

Apart from the meetings within the framework of the conference 'Youth for Peace in the Transcaucasus', VERTIC took the opportunity to invite the two sides for informal bilateral discussions.

Both Medoev and Zvania had agreed to participate as guests at the Batumi Conference after intensive contacts by VERTIC over several months. Dennis Sammut and Nikola Cvetkovski, Georgia Youth Project Administrator, visited the South Ossetian capital, Tskinali, on various occasions for meetings with the South Ossetian side. Shortly before the Batumi Conference they met with the Chairman of the Supreme Soviet of South Ossetia, Ludwig Chibirov, and the Prime Minister, Vladislav Gabaraev. Both leaders stressed to the VERTIC delegation the importance they attached to the Batumi meeting.

Preparatory work was also conducted with the Georgian side. A number of meetings were held in London and in Tbilisi with UGC General Secretary Zurab Zvania. Other meetings were held with Georgia Deputy Prime Minister responsible for the South Ossetian issue, Irakli Mengharishwilli, who also participated in the Batumi meeting. The preparatory process for the Batumi Conference also involved high level discussions with the authorities of Adjara. VERTIC representatives travelled to Batumi on five occasions prior to the conference for meetings with the Chairman of the Supreme Council of Adjara, Aslan Abashidze, and other officials. The success of the Batumi Conference was in no small way due to the contribution of the authorities of Adjara.

After the dialogue in Batumi VERTIC has kept the contacts between the two sides alive. The youth organisations of the two sides offer the best forum for dialogue. Through the Georgia Youth Project a number of new initiatives are planned. These initiatives are geared at building confidence between the two communities as a step towards lasting peace in Georgia and in the Caucasus.

Erratum

In the editorial in the last issue of *Trust & Verify*, the references to the specification of the seismic array under a comprehensive test ban should refer to 1 kiloton test *fully coupled*.

The editor regrets any confusion that this may have caused.

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Trust & Verify

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VERTIC co-ordinates six working groups comprising 50 consultants worldwide.

VERTIC is the major source of information on verification for scientists, policy makers and the press.

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