Joint Working Groups

The exchange of information between Britain and the US on nuclear weapons technologies takes place through Joint Working Groups (JOWOGs) under the Mutual Defence Agreement 1958.

In 2002 there were 16 active working groups. In 2001 these groups held a total of 181 meetings.[1] 61 of these took place in the UK and the remainder in the US. There were similar numbers of meetings in 1999 and 2000. UK meetings take place at Aldermaston. US meetings are held at Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL) and Sandia National Laboratory (SNL). Some meetings have been held at other nuclear weapons sites.

JOWOGs have sub-groups which concentrate on particular areas. These are known as SUBWOGs. There are also Focused Exchange meetings of JOWOGs on particular topics. In 2001 for each working group there were an average of 11 meetings. Some working groups have more meetings than others.

JOWOG meetings are normally over 2 days and the participants discuss several scientific papers. Most of these papers are of US origin. An example of the papers considered at JOWOG 22 meetings is given below. A few papers are available on the internet, the classification of other papers will vary. Some JOWOG meetings can involve over 70 people, but most are smaller.

In addition to the JOWOGs there is an annual high-level Stocktake meeting. This is likely to be an overall review of exchanges which have taken place and an identification of key areas for future work.

Below is a list of JOWOGs. Information about what each does is patchy. There are scientific references to papers which were originally presented at JOWOG meetings.[2] The details below give only a hint of the range of subjects which each working group considers. Some JOWOGs have titles which are very broad and it is difficult to understand how subjects are allocated between them. Computer software issues are key to the development of nuclear weapons and are considered by several working groups.

It is likely that the US has only supplied detailed design information to Britain for warheads which Britain has produced, or was planning to produce. In addition papers from research work on specific aspects of other warheads is sometimes shared. Although the W76 warhead was designed at LANL and SNL, there is also considerable input to the JOWOGs from LLNL.

JOWOG 6 Radiation Simulation and Kinetic Effects

One of the papers for a meeting of SUBWOG 6N in 1989 was on a radiation simulation with regard to the W88 warhead.

A paper on neutron induced single events was presented to a SUBWOG 6P meeting in 1989.

JOWOG 9 Energetic Materials

This working group considers High Explosives used in nuclear weapons. LANL papers on the explosive used in US W76 Trident warheads, PBX 9501, have been presented to JOWOG 9. A paper from LLNL in October 2001 considered the suitability of LLM105 as an Insensitive High Explosive.

JOWOG 22 Nuclear Materials

The following papers were considered at a JOWOG 22 Plutonium Focused Exchange meeting at LLNL on 6/7 May 1996:

Composition Changes in Weapons Alloys as a Function of Time;
Direct Into Shell Casting;
Moisture-Enhanced Corrosion of Plutonium;
Neutron Diffraction Studies of Plutonium Alloys;
Acoustic Resonance Spectroscopy in Surveillance;
EXAFS and X-Ray Diffraction of Pu Alloys;
Neutron Diffraction Studies of Plutonium Alloys;
Bonding Techniques.

The following papers were considered at a JOWOG 22 Conference on Actinide Stabilization, Packaging and Storage at LANL on 21/22 May 1996:

Discussion of Known Container Failure Mechanisms;
Plutonium Metal, Oxide and Residue Stabilization Parameters;
Pressurization and Condensation in Long-Term Storage Containers;
Recent Findings.

JOWOG 22D considered a paper on welding techniques at a 1988 meeting. This sub-group has also met at Aldermaston for a joint training exchange on welding issues.

Meetings of JOWOG 22 in 1988 considered Beryllium science and airborne monitoring for Beryllium at the Royal Ordnance Factory in Cardiff. These meetings were also designated AVIS 568. A meeting of JOWOG 22B in 1993 also considered Beryllium.

JOWOG 23 Warhead Electrical Components and Technologies

No direct references to this working group were found, but there was a reference to an SNL radar representative on a JOWOG, which could be JOWOG 23.

JOWOG 28 Non-Nuclear Materials

Meetings have considered papers on Uranium hydride. This is used to store tritium and to transport it between the UK and US.

One of the papers for a 1987 meeting of JOWOG 28A was on organic coatings.

JOWOG 29 Nuclear Counter-Terrorism Technologies

JOWOG 30 Facilities

In 1998 there was an exchange of information on lightning safety measures at the nuclear weapons assembly sites at Pantex in the US and Burghfield in Britain. This was carried out through JOWOG 30.[3]

In March/April 1995 LANL exchanged information on salt distillation as an aspect of Actinide research. The exchanges took place through JOWOG 30A and also through a French/LANL meeting.

JOWOG 31 Nuclear Weapons Engineering

One of the papers for the October 2003 meeeting was on LLNL's Verification and Validation strategy for the w-program. This is a program which considers stockpile management and life extension issues for warheads designed at LLNL. Verification and Validation is part of the Advanced Computer Simulation Initiative (ASCI).

JOWOG 32 Nuclear Warhead Physics

A meeting at Aldermaston in October 2000 included 27 US representatives from LANL, LLNL and SNL.[4] They discussed the interaction and performance of nuclear materials at high temperature and pressure.[5]

JOWOG 32P considers combined-primary weapons physics and hydrodynamics. A combined primary includes both plutonium and highly enriched uranium. In 2000 the subgroup was chaired by a scientist from LLNL.

JOWOG 34 Computational Technologies

JOWOG 36 Aircraft, Missile and Space Systems Hardening

JOWOG 37 Laboratory Plasma Physics

Some meetings have been attended by 75-100 people. There are a considerable number of references to scientific papers which have been presented to these meetings. The subjects have included fusion energy.

An LANL paper for the February 1998 meeting was on OMEGA architecture, capabilities and operations.

JOWOG 39 Manufacturing Practices

The remit of this working group has also been described as Manufacturing Technology. There are regular Focused Exchange meetings on Software Quality Assurance which ~~are~~ involve liaison between Aldermaston and the US Department of Energy Software Quality Assurance Subcommittee (SQAS).[6] In 2002 these software meetings were taking place quarterly. The agenda of these meetings included model –based engineering.

A meeting of JOWOG 39B took place in Burghfield in 1988.

The 6th meeting of JOWOG 39D in 1994 considered a paper on the high resolution density measurement of High Explosive components using computer tomography.

A sub-group of this working group, SUBWOG F Robotics, met in April 1994 at Oak Ridge in the US and considered robotics used in handling nuclear materials and nuclear waste.

There is a manufacturing technology steering group of JOWOG 39 which includes a representative from the Department of Energy.[7]

JOWOG 41 Nuclear Warhead Accident Response

The co-chair for Health and Safety from 1993 to 1999 was a US Navy captain with experience in nuclear safety issues.

JOWOG 42 Nuclear Weapon Code Development

JOWOG 43 Nuclear Weapon Environment and Damage Effects

The US Defence Budget for FY2004 includes providing Aldermaston with access to the Nuclear Weapons Effects (NEW) program through this working group.[8]

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[1] Written answer from Dr Lewis Moonie, Hansard, 25 January 2002
[2] Based on Google searches on the internet for JOWOG and SUBWOG.
[3] Defence Nuclear Facilities Safety Board reports on Pantex.
[4] Written answer from Dr Lewis Moonie, Hansard, 25 January 2002
[5] AWE annual report 2000.
[6] There are several references on the SQAS website.
[7] The DOE representative is from a NNSA team which is responsible for knowledge preservation and for manufacturing capabilities required for Stockpile Life Extension.
[8] 0602715BR Weapons Effects, DTRA, FY2004 Defense Budget.