INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
UNION GEODESIQUE ET GEOPHYSIQUE INTERNATIONALE

STATEMENT

"Volcanological and Meteorological Support for Volcanic Ash Monitoring"

Adopted by the IUGG Bureau on 28 May 2010
This Statement follows the IUGG Statement of 20 April 2010 on Volcanic Ash Clouds.

The eruptions of Eyjafjallajökull, Iceland, during early 2010, have highlighted the importance of a close understanding of the eruptive state of each of the world's active volcanoes, for the safety and health of local residents as well as for air traffic and other purposes. It has become increasingly evident during the eruption that accurate specification of the ash column height and the ash characteristics from the eruption are necessary for safe and efficient routing of air traffic. To be able to forecast ash clouds for the aviation hazards, the clouds' concentration, particle size and total mass is required in real time. The work of the volcanologists and meteorologists of Iceland, bringing together earth and atmospheric sciences, in support of the operations of the London Volcanic Ash Advisory Centre, has been critically important in this regard.

In improving the global response to volcanic clouds as aviation hazards, it must be understood that the great majority of the Earth's active volcanoes are located in less industrialized countries or in remote locations, and are not monitored to the standards of Iceland. Only about 50% of the World's volcanoes that currently threaten air operations have any sort of ground based monitoring. Also, less than 50 of the 1300 volcanoes with Holocene age eruptions (approximately the last 12000 years) worldwide are considered to be *well* monitored.

In this regard, the IUGG emphasises:

- The capability to understand, forecast and promptly report eruptions, based on thorough study and instrumentation of active volcanoes, remains vital for aviation safety, for residents exposed to local volcanic hazards, and also for assessing the magnitude and effects of volcanic emissions on our atmosphere and climate;
- An improvement in support for local volcano observatories would improve the timing, scope, and accuracy of information on volcanic activity;
- In meeting requirements from the International Civil Aviation Organization (ICAO) for States to provide volcanological information to aviation, the long term sustainability of such support for volcano observatories is an important consideration. ICAO, advised by the International Union of Geodesy and Geophysics and other organisations including the World Meteorological Organization (WMO), has prepared arrangements where a State may choose to recover reasonable costs for the provision of information to aviation from the aviation

industry. A State could, alternatively, choose to support observatories directly without such arrangements. Guidelines on these issues are now available as referenced below;

- Any volcanic crisis places high pressure on the responsible agency: support for aviation functions is typically only one of many aspects of a volcanic crisis that volcanologists must consider. International science protocols, prepared by IUGG constituent association, the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), already exist to assist in scientific cooperation during a crisis, and may be useful in the context of an aviation-focused volcanic crisis;
- Where observations exist (such as satellite data, pilot reports and meteorological radar coverage over a volcanic area), arrangements for multi-disciplinary observation sharing between all those concerned with the hazard assessment from the volcanic activity should be specified and followed to ensure the best possible use of observations.

In summary, increased support for the volcano observatories of the world, as part of the international science effort to improve volcanic cloud monitoring, is a necessary measure for improving volcanic impact management and aviation safety as well as for aiding natural hazard mitigation on the ground.

Further Reading:

Ewert, J.W., and Newhall, C.G., 2004, *Status and challenges of volcano monitoring worldwide*, *in* Proceedings of the 2nd International Conference on Volcanic Ash and Aviation Safety, June 21-24, 2004, Alexandria, Virginia: Office of the Federal Coordinator for Meteorological Services and Supporting Research, session 2, p. 9-14, available at http://www.ofcm.noaa.gov/ICVAAS/Proceedings2004/ICVAAS2004-Proceedings.htm

Guidance for State Volcano Observatories: The International Airways Volcano Watch, available at www.wovo.org

IAVCEI Subcommittee for Crisis Protocols: Newhall, C., Aramaki, S. Barberi, F., Blong, R., Calvache, M., Cheminee, J.-L., Punongbayan, R., Siebe, C., Simkin, T., Sparks, S., and Tjetjep, W., 1999. *Professional conduct of scientists during volcanic crises*, Bulletin of Volcanology, 60, p. 323-334. http://www.springerlink.com/content/5dbwwa6qff64uqbw/