XXVIII ANTARCTIC TREATY CONSULTATIVE MEETING (ATCM) AT STOCKHOLM (SWEDEN) DURING 6-17 JUNE, 2005

In historic terms, the exploration of Antarctica has been recent, most of it having accomplished during the twentieth century.

The improved technology and knowledge of the last 100 years allowed greater access to the continent, encouraging detailed surveying and research, and the gradual occupation of Antarctica by scientific stations. By mid 20th century, permanent stations were being established and planning was underway for the International Geophysical Year (IGY) in 1957-58, the first substantial multi-nation research program in Antarctica. Around the same time, territorial positions had also begun to be asserted, but not agreed, creating a tension that threatened future scientific cooperation.

The IGY was recognized as pivotal to the scientific understanding of Antarctica. The twelve nations active in Antarctica, nine of which made territorial claims or reserved the right to do so, agreed that their political and legal differences should not interfere with the research programmes. The outstanding success of the IGY led these nations to agree that peaceful scientific cooperation in the Antarctica should continue indefinitely. Negotiation of such an agreement, the Antarctic Treaty, commenced immediately after the IGY.

The Antarctic Treaty

The Antarctic Treaty was signed in Washington on 1st December 1959 by the twelve nations that had been active during the IGY (Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, United Kingdom, United States and USSR). The Treaty, which applies to the area south of 60° south latitude, is surprisingly short, but remarkably effective. Through this agreement, the countries active in Antarctica consult on the uses of a whole continent, with a commitment that it should not become the scene or object of international discord. In its fourteen articles the treaty:

- stipulates that Antarctica should be used exclusively for peaceful purposes, military activities, such as the establishment of military bases or weapons testing, are specifically prohibited;
- guarantees continued freedom to conduct scientific research, as enjoyed during the IGY;
- promotes international scientific cooperation including the exchange of research plans and personnel, and requires that results of research be made freely available;
- sets aside the potential for sovereignty disputes between treaty parties by providing that no activities will enhance or diminish previously asserted positions with respect to territorial claims, provides that no new or enlarged claims can be made, and makes rules relating to jurisdiction;
- prohibits nuclear explosions and the disposal of radioactive waste;
- provides for inspection by observers, designated by any party, of ships, stations and equipment in Antarctica to ensure the observance of, and compliance with, the treaty;
- requires parties to give advance notice of their expeditions;
- provides for the parties to meet periodically to discuss measures to further the objectives of the treaty; and
- puts in place a dispute settlement procedure and a mechanism by which the treaty can be modified.

The Treaty also provides that any member of the United Nations can accede to it. The treaty now has 45 signatories, 27 are consultative parties on the basis of being original signatories or by conducting substantial research there. Membership continues to grow. Since entering into force on 23 June 1961, the treaty has been recognised as one of the most successful international agreements. Problematic differences over territorial claims have been effectively set aside and as a disarmament regime it has been outstandingly successful. The treaty parties remain firmly committed to a system that is still effective in protecting their essential Antarctic interests. Science is proceeding unhindered.

Annual Meeting

Since the first Antarctic Treaty Consultative Meeting (ATCM) in 1961, the parties have met frequently, now annually, to discuss issues as diverse as scientific cooperation, measures to protect the environment, and operational issues – and they are committed to taking decisions by consensus. This process has allowed the Antarctic Treaty to evolve into a system with a number of components that meet the special needs of managing activities in the Antarctic, while protecting national interests.

This regime is now known by the broader title of the Antarctic Treaty System, which operates under the umbrella of the annual Antarctic Treaty Consultative Meeting (ATCM)

The Treaty System includes the recommendations, measures, decisions and resolutions of the Consultative Meetings relating to matters such as

- scientific cooperation,
- protection of the Antarctic environment,
- conservation of plants and animals,
- preservation of historic sites,
- designation and management of protected areas,
- management of tourism,
- information exchange,
- collection of meteorological data,
- hydrographic charting,
- logistic cooperation, and
- communications and safety

The treaty parties have put in place rules relating to specific issues The development of these agreements has allowed the implementation, with greater precision, of legally binding provisions for the regulation of activities in Antarctica

The XXVIII Antarctic Treaty Consultative Meetings were held in Stockholm (Sweden) during 6-17 June, 2005 Many officials representing Govt of India were deputed to participate in the XXVIII Antarctic Treaty Consultative Meetings

Swedish Minister for Foreign Affairs, Ms Laila Freivalds opened the 28th Antarctic Treaty Consultative Meeting (ATCM) on Sweden National Day, June 6, 2005 at the National Museum of Science and Technology in Djurgarden in Stockholm Ambassador Hans Corell chaired the 28th ATCM More than 300 researchers, experts and representatives from about 50 governments and international organizations met in this meeting at Stockholm

In the 28th ATCM, major issues related to Environmental Protection and Liability Annexure to the Environmental Protocol were discussed at length Issues dealing with environment and climate change as well as Antarctica's importance in global environment were in focus during both weeks of the 28th ATCM

During the first week of the ATCM good progress was made in the negotiation on liability in the event of environmental accidents in Antarctica Major efforts were made to conclude negotiations on a special protocol for regulating issues of responsibility, insurance and damages for activities in Antarctica such as, major accidents, oil spills etc After almost thirteen years of negotiations, the Antarctic Treaty parties have agreed on liability rules in the event of an environmental emergency in Antarctica

The aim of the new Annexure to Environmental Protocol is to prevent environmental emergencies in Antarctica Everyone who operates in Antarctica must work to avoid emergencies Should an emergency takes place nevertheless, whoever causes the damage must take measure to minimize and contain the impact Such an annexure is legally complicated one as it involves the rules of international law as well as national and international tort law, procedural law and insurance law Since there is disagreement on sovereignty in Antarctica, all negotiations were made without touching on this sensitive issue Accordingly as per this annexure each state will take responsibility for its operators and all states will cooperate

The Committee for Environmental Protection (CEP) meeting was opened by Minister for the Environment Ms Lena Somrnestad on 6 June, 2005 CEP of the Antarctic Treaty parties has agreed to appoint a steering group for future environmental challenges in Antarctica It was also agreed upon that Steering Group will also identify the future role and responsibilities of the CEP Work on the strategy will be prepared by the steering group ahead of the CEP meeting in the United Kingdom next year

The CEP completed its environmental negotiations and the final report was formally adopted

Issues on biological prospecting in Antarctic research as well as questions pertaining to the ever increasing tourism in the icy continent, the preparations for the International Polar Year (IPY) 2007/2008 and issues concerning the work programme and resources for the international Antarctic Secretariat in Buenos Aires, were the other significant and important issues on the agenda for the 28th ATCM

The members of Indian delegation also discussed various aspects of convening an ATCM with the local secretariat, covered various management/strategic work plans The discussions with the local organizers and the representatives from Edinburgh (the venue for 29th ATCM) were fruitful to prepare for 30th ATCM at India Besides many management Plans for Antarctic Specially Protected Area (ASPA), the Indian proposal to declare Dakshin Gangotri Glacier at Dronning Maudland region was finally accorded approval by CEP of ATCM and was notified with ASPA No 163 In another significant development, India in response to the Working paper #27

(Rev 1) entitled "Draft Antarctic Specially Managed Area (ASMA) Management Plan for the Larsemann Hills, East Antarctica (jointly by Australia, China and Russian Federation), referred to information Paper # 80, submitted under Agenda Item 4a, details on the proposed site for the new Indian research base, located in the Larsemann Hills

His Majesty King Carl Gustaf (King of Sweden) showed personal and keen interest in the 28th ATCM and visited the meeting venue and addressed the delegates

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REDUCTION OF GRAVITY AND MAGNETIC DATA

We have contended that Bouguer and magnetic anomalies are proportional to vertical gradient of gravity and magnetic fields (Kesavami et al 2005, *Jour Geol Soc India, v 66, pp 510-511*) They only indicate the variations in density and magnetization respectively but not the mass distribution The primary requisite for comparison of any data is that it should be on a horizontal plane It is also mandatory that the signatures of the anomalies should not change at different levels

As the measured field in VG, SG, FA and BA are all station anomalies and the measured field is the vertical differences between un-even ground surface and even geoid level, these anomalies may be brought to a common datum in free air or mean sea level / geoid level The free air correction factor (FC) can be used to bring the station anomalies on to a common datum in free air If the FC is used as a correction factor for the increase in height and added to the station anomalies, all the anomalies show similar signatures as that obtained in VG, showing the inverse relationship with height That is, they are proportional to vertical gradient anomalies This is exactly what we observe in gentle undulating and plain areas However, if the FC is used as upward continuation and the correction is subtracted, because of the decrease of natural vertical gradient with height, all the anomalies show similar signatures as obtained in SG, revealing the mass distribution

As the measured field is the vertical differences, by logic, the data on even datum would be a mirror reflection of the uneven surface anomalies That is, the observed data on the uneven surface equals to inverse or negative of the measured field on the even surface The VG and SG at geoid level are equal to negative of VG and SG on the ground surface Thus, station level VG is equal to geoid level SG Similarly, station level SG is equal to geoid level VG which is the true gravity field on the geoid However, the FA and BA anomalies have to be brought on to one horizontal plane before transferring the data on to geoid because of the change in signatures due to elevation The even datum anomalies in free air are similar to that obtained on geoid level without any change in signatures We observe that the VG at station level is less compared to VG at Geoid level However, SG at geoid level is less than the SG at station level because the mass above the geoid is removed The vertical gradient anomaly due to the topography above mean sea level ie , the difference between the VG at station level and the geoid level is equal to twice of VG Similarly the difference of SG between the station level and geoid level is twice that of SG

For calculation of the geoid height, the transferred VG and SG anomalies on the geoid which are different from the free-air and Bouguer anomalies should be used By analogy, the magnetic data can also be reduced to geoid level or in free air These preliminary observations may have far reaching implications and further research may help minimize the ambiguities in the gravity and magnetic exploration from data collection to interpretation

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