

Federation of Digital Seismographic Networks

Minutes, 1994 Annual Meeting

*27th IASPEI General Assembly
January 11 and 18, 1994, Wellington, NZ*

The following summarizes the discussions held by the Federation over two days; on request by the Chairman, matters which need urgent approval or examination by the Working Groups are discussed first. Working Groups convene after the first day of the Federation assembly and report on the second day. A joint summary is given here, which does not attempt to be a detailed record of all the discussions. The list of attending scientists is attached.

1. Adoption of Agenda

It is proposed to change the Agenda as follows: Item 11: OSN and ION reports; Item 14: new business; Item 15: appointment of nominating committee and election of new officers; Item 16: next annual meeting; Item 17: IASPEI resolution.

The Agenda is further adopted.

2. Approval of Minutes of 1992 Seattle meeting

The Minutes of the 1992 Federation Annual Assembly are adopted without changes.

3. Chairman Report

The Chairman welcomes all participants and notes that accomplishments in all goals set by the Federation are highly visible; members should be pleased.

4. Reports of Members on Network status and Data Distribution

Reports were given by representatives from Australia (ANSN), Canada (CNSN), China (CDSN), France (GEOSCOPE), Germany (GRSN, GEOFON), Italy (MedNet), Japan (POSEIDON), Mexico (MNSN), Orfeus, CSI and US (IRIS/GSN, IRIS/DMC, USGS/USNSN). Most of these contributions have been received in written form and are added to the minutes (Appendix A).

The proposal by A. Morelli to publish the member reports in a single volume is endorsed by the assembly; the collective report *1994 Status Report of the FDSN* is now published on *Annali di Geofisica* (vol. 37, 1037-1112), edited by A. Morelli.

5. New Networks and Federation members

Members report on new national initiatives for the installation of VBB stations. The Chairman welcomes the possibility of accepting new members in the Federation, provided that the

condition of free distribution of data to Federation members and archive is maintained, and underscores the need to contact the new networks to ensure coordination.

Among the projects planned or under way: Iran has 13 VBB stations on order, the first portion of a denser national network; Egypt is presently installing a digital network including VBB sites; India is making plans for a national digital network of perhaps 20 stations, possibly run by a special institute formed with this task; Taiwan is already producing BB data in SEED format.

6. Reports of the Working groups and ad-hoc Committees

• WG-I ON SITING PLANS AND FEDERATION NETWORK.

Report is enclosed (Appendix B). The station listings, which now include also the operation dates, is available via *anonymous FTP* on GLDFS.CR.USGS.GOV (136.177.20.1), in the file FED.STN on area FDSN. The assembly discusses in detail the concept of Federation Network; the Chairman recalls the original goal of a uniform global network, yet to be achieved even if some regions are now covered by much denser networks; this goal should still be pursued by the Federation, leaving to regional organizations (ex. ORFEUS, POSEIDON) to deal with denser regional coverage. New members and regional networks, on the other hand, are worried about maintaining sufficient funding without the endorsement of the Federation and propose changing the goal of the FDSN recognizing the need for denser station spacing in continental areas (1000 km) versus oceanic areas (2000 km). Both points of view are contained in the resolution submitted to IASPEI (item 17). The revised Federation network, still defined as the subset of global stations distributed on Federation CD-ROMs and archived in the Federation Archive at IRIS DMC, contains now 145 stations (several are planned sites).

• WG-III ON DATA EXCHANGE

B. Dost reports the results of the discussion on five items.

(i) ~~Auto DRM~~ standardization is needed for automatic data requests submitted by email to different data centers; the GSE has developed its own format, different from SEED, and adopted the Swiss AutoDRM, which supports only ASCII email transmission; the following statement is approved: "the Federation proposes to adopt the Swiss AutoDRM, with the possibility to extend its functionality; all new request-formats should be backward-compatible"; the Federation is evaluating the possibility and the minimum functionality required for supporting both GSE and SEED formats, with GSE/SEED translators to be made available; R. Buland will report to GSE in 1994.

(ii) ~~SEED~~ a new manual is available from IRIS-DMC. Still minor modifications are introduced.

(iii) ~~Gopher~~: GOPHER allows the retrieval of about 35 stations following a large event; the role of regional nodes and sub-nodes (ORFEUS, POSEIDON, TERRASCOPE, GEOSCOPE) has proved useful and will be extended in the future (GTSN in 1994). The name GOPHER being a common INTERNET utility, the new code SPIDER will be adopted in the near future.

(iv) ~~FDSN CD-ROM~~: reported under item 8.

(v) *Quality Control*: the urgent need to establish formal ways to report quality and

problems in stations and data is under discussion.

- **FEDERATION ARCHIVE ADVISORY COMMITTEE.**

A report is enclosed (Appendix C); highlights are under item 7.

- **WG FOR THE FDSN STATION BOOK.**

A report is enclosed (Appendix D); highlights are under item 9.

- **WG ON PORTABLE BB INSTRUMENTATION.**

The need is felt for improved cooperation in the ever larger community of portable and semi-permanent broad-band arrays, which could benefit from the Federation experience on formats, compatibility, data access (see Item 14). A Working Group is formed, composed initially by J. Fowler, B. Dost, R. Kind and J. Virieux; the first meeting is planned in Potsdam for the summer 1994.

7. Federation Archive

The report of the Federation Archive Advisory Committee is enclosed (Appendix C). IRIS reports on new equipment and improved performance at the Federation Archive at IRIS-DMC; GSN is only a small portion of the data stored, dominated by JSP and PASSCAL; customized data requests still dominate, while pre-assembled SEED event volumes are becoming more common, available to FTP users with FARM; tools are available at the DMC, including translators to different formats, software for format decoding (Steim/1-2) and for instrument response (SEED-Response), user-friendly tools (XTRACT, SPROUT, BREQ-FAST, FARM), a DMC tutorial, documentation in hard-copy and on FTP.

8. Federation CD-ROM

S. Sipkin reports on the production of the first Federation CD-ROM and on future plans. The CD-ROM, containing data for Jan-Feb 1990, is almost ready and will be distributed by the end of 1994. Data are extracted from the Federation Archive at IRIS-DMC and checked in Golden. The software for the whole operation is now ready, but it is not available on PC, as the new SEED cannot be read yet on PC. The final goal is the distribution of a CD every two months, with no more than 6 months delay; to bring the program on schedule, the USGS is prepared to produce more than 6 CDs yearly; a new schedule is set up to catch up with the mastering and distribution: by September 1994 all 1990 data must be in Golden, followed by the submission of 6 months of data every 3 months; to maintain this tight schedule for the submission of data, the assembly agrees that data not submitted in time will not be included in the latest CD release; for the time being the CD will be mastered when full, independently of date limits. The role of the Federation CD-ROM is confirmed as the collection of event volumes recorded only by the Federation network; other networks and stations not included in the Federation network must find other ways of data dissemination. The event selection criteria are discussed; the USGS supports the adoption of an automatic algorithm; with the present rate of seismicity, a 5.7 magnitude threshold would fill up a CD with 2 months of data for a Federation network of 128 VBB stations; some members point out, however, that a fixed threshold is not scientifically sound, and that the event selection should favour areas with low seismicity with a lower limit (perhaps 5.2-5.3) while areas with frequent seismicity (ex. Japan, Tonga) could use a higher limit.

9. Station Book

The report of the Working Group for the Federation Station Book, chaired by T. Ahern, and a sample from the station book are enclosed (Appendix D). The production of the station book is almost ready and a preliminary version has been circulated. The final format has been defined; the book includes color photos (only at IRIS-DMC) and noise studies, when available; about 150 stations are included now, and plans are being discussed to include all planned and proposed stations (more than 400 ?). IRIS will maintain its commitment for one more year; the book will not be freely distributed, due to the high production costs, and will be publicized to help sales; the possibility of making it accessible through Internet MOSAIC or on CD-ROMS will be investigated by IRIS. In May 1994 GEOSCOPE has released a volume of its station cards, also included in the Federation book.

10. ISOP report

E. Bergmann reports on the ISOP status. To test the overall program feasibility and procedures, a pilot project initiated in September 1993, extended to 30 stations, including some of the Federation; notwithstanding delays in operation and confusion in several observatories, the test has processed 5 events weekly for 14 weeks, with 1-4 late phases reported for more than 60 events. The main issue of discussion is the inclusion of digital data and networks in the experiment; the Federation itself is not a direct contributor and will maintain a minimum role in ISOP; only single station and network do participate. A document on *Measurement Protocols for Routine Analysis of Seismic Data* is submitted for discussion to the Federation members and is included in Appendix E.

11. OSN and ION reports

A. Dziewonski reports on the development of the Ocean Seismic Network and of the newly formed Interdisciplinary Ocean Network. The Federation has always been supportive of OSN, since its debut in 1989; the progress is slow, given the high costs and the limited number of institutions involved; an important test on comparative performance of borehole and bottom sensors was run by Franc in 1993; in June 1993 a technical meeting was held to agree on common standards for maintenance. ION is now affiliated to IASPEI with commission status, open to all countries with planned or active programs; given the interest of IAGA, IAPSO and IAVCEI, in the future ION will seek a inter-association status. A Steering Committee has been formed, including members from participating countries (Dziewonski, Montagner, Suyehiro). An international workshop on *Multidisciplinary Observatories on the Deep Seafloor*, open to scientists in all disciplines, will be held in Marseille, France, in January 1994. ION is exploring possible ties with existing large scale efforts (ex. the Inter-Ridge program) and structures (ex. the Inter-Union Commission on Under-Sea Cables).

12. GSE

B. North reports on the progress of the GSE program; new negotiations on a Comprehensive Test Ban started in Geneva on January 1994, giving renewed impetus to GSE. The experiment GSETT-III will initiate in 1995, with no ending date set, and will be based on (i) one

International Data Centre (IDC) in the US, (ii) at least 50 α stations sending continuous data with less than 1 minute delay, (iii) more than 100 β stations sending data on request by the IDC, (iv) the preparation in 4 hours of an automatic bulletin, including 100-300 events per day with magnitude exceeding at least the threshold 4, (v) the distribution of all collected data to all participants. Several members express doubts about the role of Federation in the GSE activities; few Federation stations will be used as α stations, because of limited high-frequency performance of the STS-1 sensors, while many will be used as β stations, tied so that IDC will have priority in retrieving the data; benefits to Federation members vary from country to country; in many countries a parallel organization exist, dealing with separate GSE stations. The discussion centers on ways to establish official connection and better coordination between FDSN and GSE; it is argued that a formal way cannot be found, as the GSE will not accept the FDSN as a member; North is appointed as the reporter to GSE on Federation activities; the possibility of establishing a joint Working Group on data formats and exchange will be explored; the US GSE representative, A. Kerr, is working with T. Ahern of IRIS to unify the station books of GSE and Federation.

13. FDSN By-laws

The task group formed to develop terms of reference and draft FDSN by-laws, formed by E. Engdahl (chairman), J.P. Montagner, J. Fukao and B. Dost, is continuing on its task, expected to be completed by the Federation assembly in Boulder, 1995. Relevant statutes have been collected, including the original terms of reference of the FDSN published in 1986. An item of discussion is the status and function of the Executive Committee, composed by the chairman, 2 vice-chairs, secretary and representatives from IASPEI and ILP; one point of view is that the Executive Committee is a list of elected officers, with no decisional power; a better definition is expected in Boulder. The chairman proposes to pass to a 4 years rotation period, rather than the present 2, to coincide with IUGG assemblies, where usually the members representation is better.

14. New Business

A discussion is held on the need for the Federation to become more involved with semi-permanent or portable broad-band networks. The Federation archive at IRIS-DMC is already stored jointly with the largest collection of portable digital data and passive experiments. A suggestion is made that the Federation could also keep a list of portable stations complete with deployment dates and lists of available data segments; such large undertaking, while certainly very useful, is felt to be too cumbersome by some members, who feel that it is the community of portable networks that needs to coordinate its activities in closer fashion, forming a group similar to the FDSN. To further the discussion, the assembly approves the formation of a Working Group on Portable BB Instrumentation (see item 7).

A. Tarantola reports on a new program for the development of the future generation of dense seismographic networks, with the goal of exploring the Earth's interior with a definition comparable to that reached in seismic exploration. This goal could be achieved by a network of more than 10.000 stations of simple design with automatic operation and satellite data transmission; the cost of the whole network would be in excess of 100 M\$, considered a small

price tag for the envisioned benefits. Preliminary documentation can be requested directly to A. Tarantola. In occasion of the 21st IUGG General Assembly in Boulder, the IASPEI Workshop *SW1: Seismological Networks for the next century*, convened by A. Tarantola and R. Phinney, will be devoted to this theme.

15. Appointment of nominating committee and election of new officers

With the approval of the assembly, the Federation Chairman appoints in the first day of the meeting the nominating committee for the new FDSN Executive Committee: drs. J. Woodhouse, Chairman, E. Engdahl, A. Dziewonski, R. Butler and D. Giardini. The new slate of officers named for the Executive Committee for the 1993-1995 period is composed by:

Jean Paul Montagner	Chairman
Andrea Morelli	Vice-Chairman
David Novelo-Casanova	Vice-Chairman
Bob Engdahl	IASPEI Representative
Barbara Romanowicz	ILP Representative
Tim Ahern	Secretary

The new Executive Committee is unanimously approved by the assembly.

The new Chairman takes on the conduction of the assembly.

The outgoing members of the Executive Committee are warmly thanked by the Chairman and the assembly for their service.

16. Next annual meeting

The next FDSN meeting will take place in Boulder during the 21st IUGG General Assembly, July 2-14, 1995. The FDSN meeting will be scheduled over two days in the first and second weeks of the Assembly; the precise schedule will be decided in the spring of 1995.

17. IASPEI Resolution

The following resolution is adopted by the Federation, submitted to the Resolution Committee of the 27th IASPEI General Assembly and approved by IASPEI:

Resolution n. 9: Federation of Digital Seismographic Networks

Recognizing the successful efforts conducted by the members of the Federation of Digital Seismographic Networks (FDSN) to achieve a global coverage of state-of-the-art broad-band stations, IASPEI commends these efforts and endorses (a) the continuing attempt to improve the global coverage by deploying stations in remote areas, ocean islands and on the sea floor, and (b) the need for denser coverage in continental areas for high-resolution studies of regional seismicity and Earth structure.

Adam M. Dziewonski
Chairman

Domenico Giardini
Secretary

List of Attachments

A) Member Reports:

A1: Australia (ANSN), A2: Canada (CNSN), A3: China (CDSN), A4: France (GEOSCOPE),
A5: Germany (GEOFON), A6: Italy (MedNet), A7: Japan (POSEIDON), A8: Mexico
(MNSN), A9: IRIS/GSN, A10: IRIS/DMC, A11: USGS/USNSN.

B) Report of WG-I: global distribution of digital stations and Federation Network 1994.

C) Report of the FDSN Archive Advisory Committee.

D) Report of the Working Group on the FDSN Station Book and sample for ANMO station.

E) ISOP Report: Measurement protocols for routine analysis of digital seismic data.

List of Participants

The following participants were present during most or all of the sessions:

<i>Name</i>	<i>Institution - Network</i>	<i>Country</i>
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Members:

A. Dziewonski	Chairman, Harvard Univ	USA
Y. Fukao	Vice-Chairman, POSEIDON, ERI	Japan
R. E. Engdahl	IASPEI, USGS	USA
D. Giardini	Secretary, III Univ. Roma	Italy
B. Dost	ORFEUS	The Netherlands
W. Hanka	GEOFON, GFZ	Germany
R. Buland	NEIC, USGS	USA
T. Ahern	IRIS	USA
B. North	CNSN, GSC	Canada

A. Morelli	MedNet, ING	Italy
Y.T. Chen	CDSN, SSB	China
G. Roul	GEOSCOPE, IPG	France
D. Jepsen	ANSN, AGSO	Australia
D. Novelo	MNSN, UNAM	Mexico
R. G. Pearce	Blacknest, Un. Edimburgh	UK

Observers:

G. Suarez	UNAM	Mexico
M. Henger	GRSN, GFZ	Germany
P. Basham	GSC, Ottawa	Canada
R. Butler	IRIS	USA
E. Bergman	ISOP, NEIC, USGS	USA
P. Firbas	Masarik Un., Brno	Czech Rep.
R. Kind	GFZ, Potsdam	Germany
J. Schneitzer	Bochum Un.	Germany
N. Kondorskaya	JIPE, Moscow	Russia
H. Aichele	SZGRF, Erlangen	Germany
J. Woodhouse	Oxford Un.	UK
A. Alekseev	AS, Novosibirsk	Russia
T. Jordan	MIT, Cambridge	USA
P. Maguire	Leicester Un.	UK
O. Viengkhone	Kinematics, Pasadena	USA
V. Wesson	SRC-RMIT, Melbourne	Australia
P. Bormann	GFZ, Potsdam	Germany
C. Eva	Un. Genova	Italy
G. Nollet	Princeton Un.	USA
A. Tarantola	IPG, Paris	France
S. Sipkin	USGS, Boulder	USA
S. Mueller	ETH, Zurich	Switzerland
G. Poupinet	Un. Grenoble	France
J. Berger	IDA/UCSD	USA
B. Bolt	Berkeley Obs.	USA
H. C. Nataf	Ec. Normale, Paris	France