

**Working Group on seismic Networks and Stations Codes WG-NSC  
Progress report for the period Oct. 2005 – June 2007**

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The International Registry (IR) of seismic station codes has become less useful over the decades due to the explosive growth of seismic networks and rapid advances in communications technology. International standards that have served the seismological community well for many years are no longer perceived to be adequate for network operations as evidenced by the many local and regional seismograph networks that do not follow them.

The Federation of Broadband Digital Seismograph Networks (FDSN) has recognized this issue through their efforts to collect, archive, and distribute waveform data. They have addressed it by adopting a competing station coding convention. The FDSN convention has also highlighted, while partially meeting, a long-standing need for institutions contributing data to be credited for their efforts. Addressing this divergence in nomenclature between the bulletin and waveform communities has led to the present re-evaluation of International Registry standards.

The goals of this re-evaluation are to:

- Resolve the differences between IR and FDSN practices.
- Provide attribution for derived seismic products as well as waveform data.
- Provide the ability to attribute waveform data to cooperating station operators.
- Provide backward compatibility to preserve the investment in IR based bulletins and FDSN based waveform archiving and distribution infrastructure.
- Provide a migration path so that benefits of the revised IR nomenclature can be realized quickly with little or no changes on the part of data contributors.
- Ease station-naming rules in accordance with *de facto* community standards to improve the completeness and utility of the International Registry.
- Support portable and strong motion as well as fixed seismograph networks.

Shortly before the IASPEI 2005 meeting in Santiago, Chile, EMSC, NEIC and ISC initiated the formation of the Working Group on seismic Network and Station Code (WG-NSC) under the IASPEI Commission for Seismological Observations and Interpretation (CoSOI). CoSOI approved the WG-NSC and the first Working Group meeting was held during the conference in Santiago, Chile on 4<sup>th</sup> October 2005. About 20 people have attended to the meeting that was chaired by Avi Shapira. The meeting of the WG was dedicated to introducing the problems associated with the current coding systems. Dr. Jim Lyons presented a possible scheme that could provide a solution. That scheme is based on a name comprised of a list of attributes; NN.SSSSS.LL.CCC corresponding to network code, station code, deployment and channel, respectively. Jim concluded his presentation by stating that global registering bodies can help themselves and provide a greater service to the seismological community by better clarifying the meaning of a registered station code and its area extent (e.g., rigid 1-km cube centered on the station, or the area within which physical properties may be assumed to remain the same, noting the latter area will decrease with time as scientific progress increases resolution), standardizing full station-channel naming usage and ensuring global uniqueness over time, providing while-you-wait web-based registration and providing or pointing to time-based metadata (e.g., via links to agency or data centre station book Web pages).

It was further commented and emphasized that:

- There is a general agreement on the need to properly credit station operators and data contributors.
- It is desired to rescind rigid geometrical 1-km cube view of station naming/spacing in favour of a system related to the region within which all physical parameters can be assumed to be the same (physical site continuity).
- More attributes than just site name and location must be registered. They should encompass full FDSN data channel naming convention plus source agency.
- It is important to consider the fact that several agencies may have a hand in providing/generating data from a certain station.
- The FDSN/SEED conventions should be preserved as much as possible, as there are many terabytes of data stored in SEED format globally. Tim Ahern of IRIS contended that the existing SEED format has life in it yet.
- The global registry should not limit itself to some of the obvious limitations of SEED, such as 2-character network codes. The only requirement is that the full registered values can be uniquely mapped into SEED format, taking account of data time.
- The global registering bodies were encouraged to take a more proactive role by becoming a global source/pointer for all station metadata over time, to answer such questions as (i) list all stations in Eastern Europe for which VBB data is available in 2003; and (ii) develop the service "tell me all I need to know to find and use the data for station XYZ". Jim recommends that the final rationale for station-code naming and registration be clearly elucidated and perhaps added to the NMSOP.
- The FDSN/BB-waveform community is well advanced toward solving the problem of how to uniquely identify a waveform. Changes made to SEED in recent years permit a broad range of station names and networks to be used which, when coupled with channel and location code, permit a waveform to be uniquely labelled even if it came from a sensor shared with another network. The FDSN community is clearly not as far along in identifying or tagging parametric information derived from waveforms. P. Davis expressed a strong preference for a solution that links derived information (travel time picks, amplitudes, etc.) directly to the waveform from which they were measured. From the viewpoint of data centres currently distributing the data in SEED format, this could most easily be accomplished by adopting the same network-station-channel-location scheme used in SEED.

Following the IASEI 2005 meeting, ideas were exchanged with many colleagues and ideas that have been circulating for a number of years were reviewed. In September 2006 representatives of EMSC, NEIC, and ISC met to attempt to synthesize these ideas and expand on them to best meet the expanded goals listed above. Consensus recommendations from this meeting were circulated to the members of the WG-as a basis for further discussion. It is hoped that these discussions will lead to recommendations adopted by the WG-NSC at the IUGG meeting in Perugia, Italy, in 2007.