

NORSAR

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NORSAR PHASE 3

1 July–31 December 1973

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L. EVENT PROCESSOR (EP) OPERATION

General Considerations

The data analysis part of the EP operation in this reporting period has followed a pattern which is now well-established. The analysts are quite experienced and have acquired a good knowledge about the observations from the different seismic regions of the world. A completely automatic and quite reliable seismic bulletin is now being sent out to seismological institutions in Scandinavia on a daily basis (NORSAR System Operations Report, 1 Jan - 30 Jun 1973), in order to assist them in their daily analysis work. However, we strongly believe that use of experienced analysts will always improve considerably the quality of the seismic bulletin. In case of NORSAR, most of the event solutions are accepted as they appear from the automatic EP, but quite a few solutions are also changed manually, later phases are matched, etc. The final NORSAR bulletin is prepared every week, and now sent out to 56 institutions.

The operation of the EP programs in this period has been hampered by some serious problems, mainly caused by disk/tape I/O operations. This again reflects the fact that EP is not as robust as could be desired. To improve tape handling and the disk I/O, modifications either already have been implemented or will be shortly.

Computer Utilization

During this reporting period, EP was up 41.1% of the time, according to Table K1. This is a small increase from the last reporting period, where the same number was 40.3%. Two factors may have contributed to this: the increased noise level at this time of the year causes an increasing amount of false detections to be processed by EP. Also, a certain amount of re-processing has taken place within this period.

EP Operational Problems

The TAL (Trans-Atlantic Link) file is still causing problems, being very vulnerable to improper operation of the EP system. A hangup of the file, causing no EP data to be transferred over TAL, went unnoticed from 08/23/73 to 09/06/73, before an off-line reset program was run to start up the data transfer through the file again. The hangup was caused by an improper operator action, causing EP to loop in Job Step 3 in the "Publish" mode.

Another weak point in the Event Processor design is the assignment of a partition in the Detection Bulletin File Generation Package, where hangups occur when, for some reason, an improper date has been inserted in the header(s). The logic, as it is now, is not capable of dealing with such a situation, and looping is taking place. However, by the end of the year, off-line programs for resetting pointers/entries in the TAL file, the Detection file and the Detection/Bulletin file were developed, thus making it easier to deal with such

situations. Also the possibility of improving the logic in EP dealing with these files will be investigated.

A lacking card in the object version of Monitor Common, and an End-of-File mark in the middle of Event Data Set 2 also had disturbing effects on the regular EP-processing, until errors were discovered and corrected. The general hardware problem of badly performing tape drives has also, to a certain extent, influenced the EP performance.

EP Parameters and Algorithms

No major changes have been implemented in the Event Processor system in this period.

On 30 July a change in the Job Step 3 coding, that prevented the Parameter Report from being printed unless a "fresh start" had been performed, was implemented.

The tape management routine was changed on 28 November, by adding code, making it print out the sense bytes on the 1052 Console typewriter when it declares a unit "down".

EP Performance Statistics

A summary of the analyst decisions for each of the detections processed by EP is given in Table L1. The number of noise detections (25.6%) is usually higher during the second half of the year as compared to the first half, this being caused by the many meteorological storms off the west coast of Norway throughout the fall. These variations always make it necessary to change the SNR-threshold on a seasonal basis, so that the number of noise detections is always kept at a reasonable

TABLE L1

Analyst decisions for detections processed by EP during the time period July-December 1973.

Analyst Classification	Number of Processings	Percentage
Accepted as events	3478	42.5
Rejected as being		
- Poor SNR or noise	2090	25.6
- Local Events	1085	13.3
- Double processings	654	8.0
- Communications errors	869	10.6
Sum processed	8176	100.0

level. The numbers of local events processed is still quite high (13.3%), and so is the number of errors on the communication lines (spikes) causing detections. However, most of these detections are identified as such already in DP, and changes are now initiated so that they will not be processed unless there is reasonable doubt as to their origin. The statistics of the reported events is given with somewhat more detail in Table L2 and also shown in Fig. L1. The total number of events is decreasing throughout the fall due to the above-mentioned noise conditions, and the average number per day is 17 as compared to 20 for the first half of 1973. 80% of the reported events are teleseismic and 20% core phase events, which is the typical relationship for NORSAR.

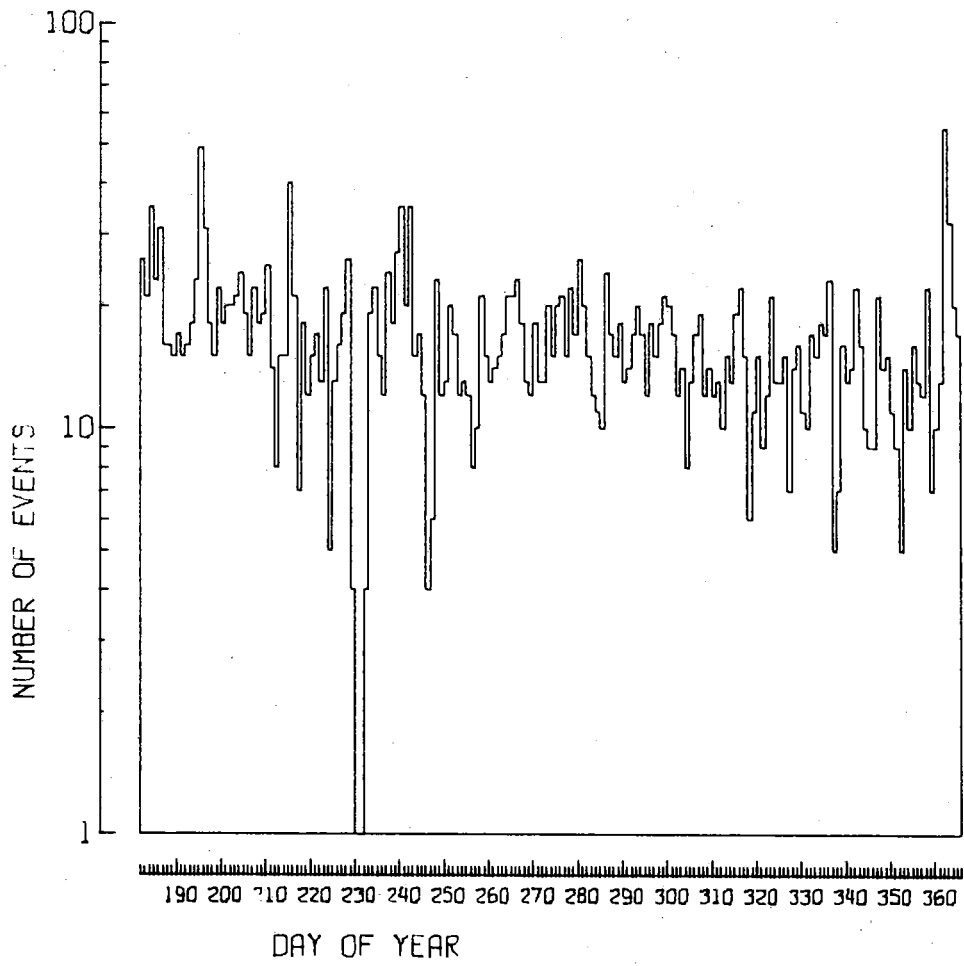


Fig. L1 Number of reported events as a function of day of year for Jul-Dec 1973.

TABLE L2

Number of teleseismic and core phase events reported by NORSAR during the time period July-December 1973.

Month	Teleseismic	Core	Sum
July	538	112	650
August	407	117	524
September	366	80	446
October	422	92	514
November	349	69	418
December	324	153	477
Sum	2406	623	3029

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