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COLD REGIONS AND OFFSHORE TECHNOLOGY RESEARCH

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August 27, 1985.

Dr. G. Cox,
U.S. Army Corps of Engineers,
Cold Regions and Engineering Laboratory,
72 Lyme Road,
Hanover, New Hampshire,
03755.

Dear Gordon;

Re: Ice Investigation Around a Caisson Island in the Beaufort Sea (Contract DACA89-85-M-1684)

I thought it was time I dropped you a note describing the status of this project.

Currently, I am reviewing the data which was collected, and I am in the process of writing the final report.

Like many field studies, the project did not proceed exactly as we had originally proposed, and in hindsight we would have done some things differently. However, the final outcome is that we did obtain some useful data which adds to our total knowledge base of how ice acts on arctic structures surrounded by stable rubble fields. (Although the results obtained have not revealed any new spectacular findings.)

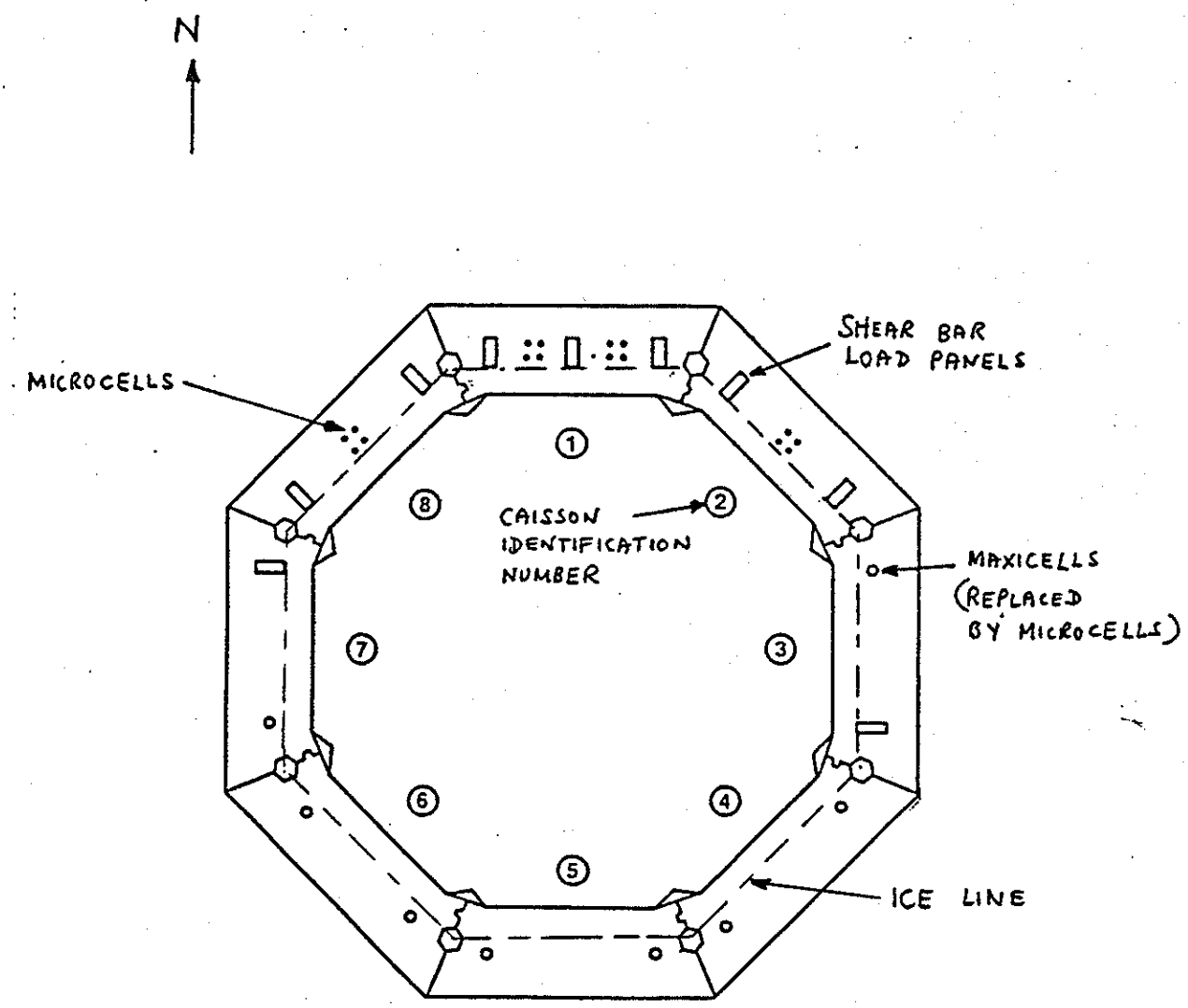
As you know, the original objectives of the program were to see how ice pressure sensors in the ice compared with the load cells on the structure; and also to gain a better appreciation of typical loads acting on rubble fields and the amount of load transmitted through the rubble to the structure. As you also know the original plan was to do the work at the Gulf Molliqpak. But the ice there never did stabilize, nor did a rubble field form. Fortunately (as you also know) I had arranged a contingency plan to do the work at the Esso CRI, and that is where the study was performed. The Amerk location was in 26m of water at the very edge of the normal landfast ice limit - see Figure 1.

The combination of late funding; waiting to see if the ice would stabilize around the Molliqpak; and the necessity to wait for accommodation at the CRI, led to the field installation not commencing until February 21, 1985. By this time there was a fairly large grounded rubble field around the CRI (see Figures 2 and 3).

Nevertheless I was optimistic that the study objectives could still be met, and I had been able to squeeze into the project budget a total of seven ice pressure sensors (compared to the original four described in the letter of contract of February 4, 1985). Also, because of the additional funding from CRREL I knew that I could continue monitoring through May if conditions permitted. Furthermore, although the ice rubble appeared to be well grounded, the ice around Amerk was still quite mobile (except to the south). I felt therefore that there was still a good chance of major ice loading events occuring causing ice loads to be transmitted through the consolidated layer in the rubble to the CRI.

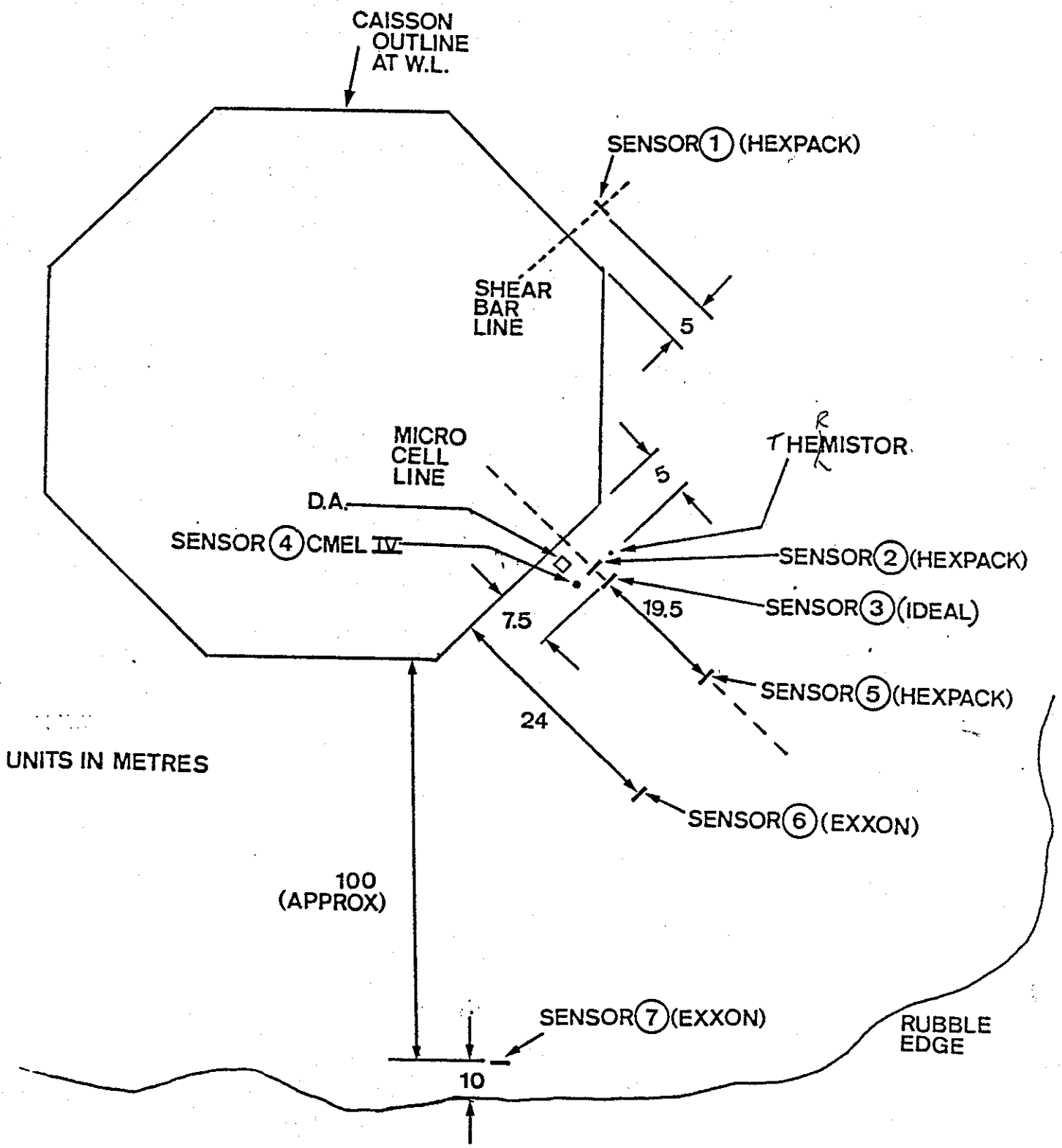
An immediate dilemma on arriving at the site was the question of where to deploy the sensors. The North and N.E. caissons are the most heavily instrumented (see Figure 4). Prior to arrival at the site, a review of rubble field features (see Figure 3) suggested a possible deployment of most of the sensros in a sector off the N.E. caisson where the rubble appeared to be low.

However, closer inspection of the rubble indicated virtually no flat spots off the N.E. caisson. Furthermore, the very high grounded rubble at



ESSO CRI ICE LOAD SENSORS

FIGURE 4



SENSOR LOCATION AND IDENTIFICATION NUMBERS

Figure 5

ESSO S PANEL 103

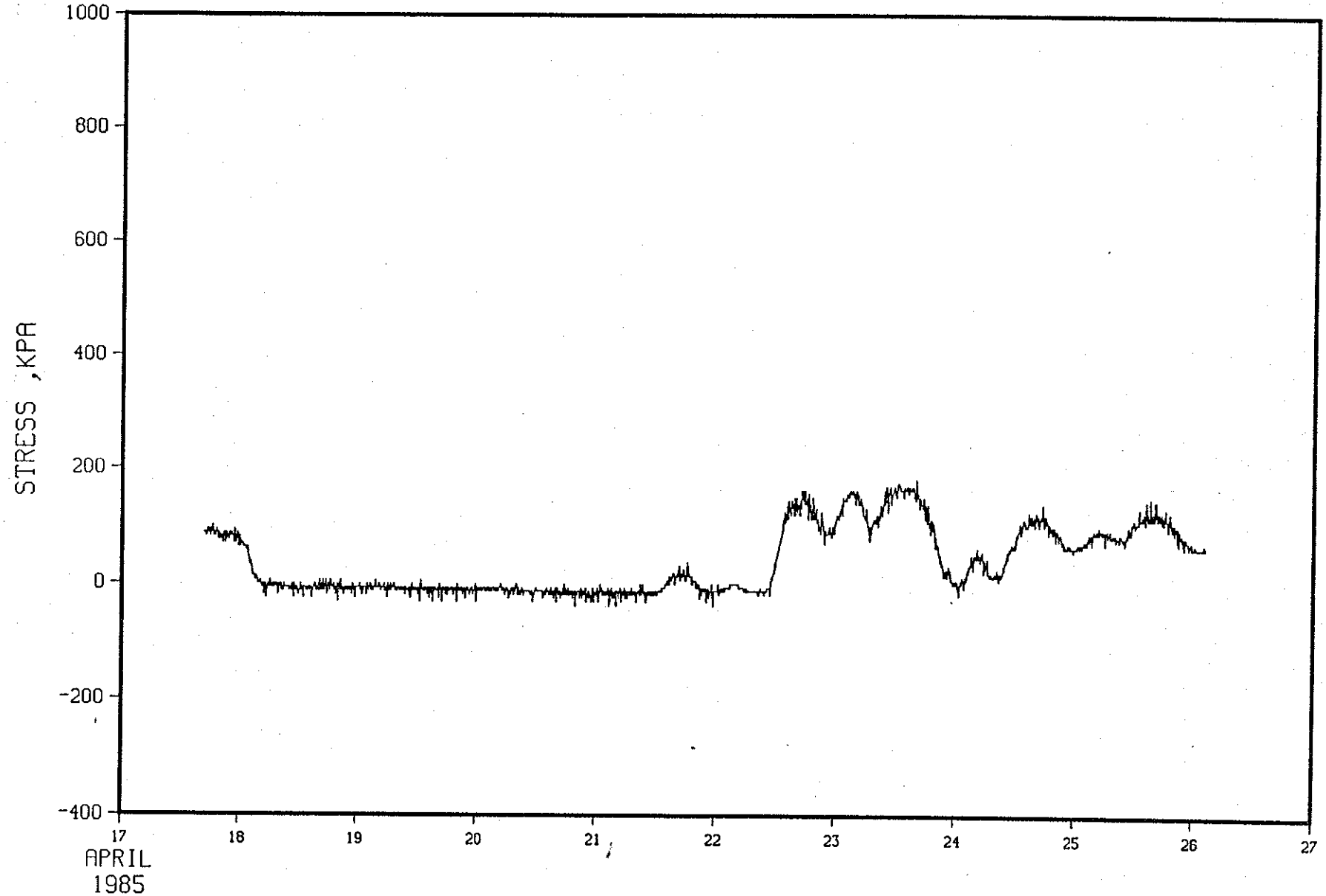


FIGURE 6

HEX PANEL 105

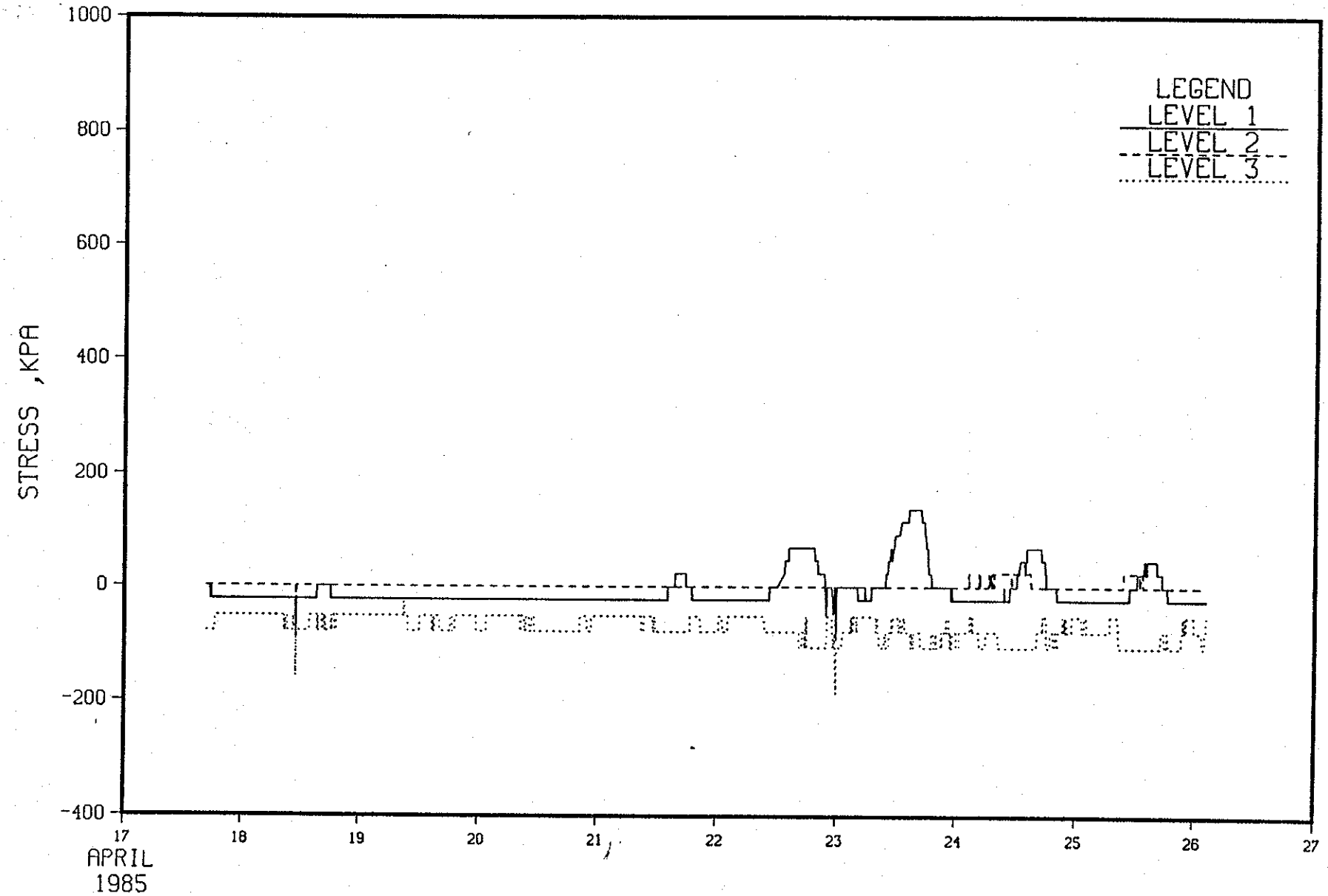


FIGURE 7