

CSAR Service - Management Report

July 2000

This report documents the quality of the CSAR service during the month of July 2000.

A more comprehensive report is provided quarterly, which additionally covers wider aspects of the Service such as information on Training, Application Support and Value-Added services.

This and other such reports are made available through the Web to staff within EPSRC and the other Research Councils, to CfS staff and CSAR Service users. The reports are indexed in a similar way to that which other useful information and news are listed for selection.

1. Introduction

July has seen the T3E workload at 57% above baseline for the month.

There have been no system level events this month.

The workload has continued to rise with 70% of jobs being larger than 32 PEs.

The CSAR User Steering Group met at UoM, where it was decided to introduce a development queue.

This document gives information on Service Quality and on actual usage of the CSAR Service during the reporting period of July 2000. The information, in particular, covers the availability and usage of the following two main CSAR Service High Performance Computing (HPC) systems:

- Cray T3E-1200E/776 (Turing)
- SGI Origin2000/16 (Fermat).

The information is provided in both textual and graphical form, so that it is easier to see trends and variances.

2. Service Quality

This section covers overall Customer Performance Assessment Ratings (CPARS), HPC System availability and usage, Service Quality Tokens and other information concerning issues, progress and plans for the CSAR Service.

2.1 CPARS

Table 1 gives the measure by which the quality of the CSAR Service is judged. It identifies the metrics and performance targets, with colour coding so that different levels of achievement against targets can be readily identified. Unsatisfactory actual performance will trigger corrective action.

CSAR Service - Service Quality Report - Performance Targets

| Service Quality Measure | Performance Targets | | | | | |
|--|---------------------|---------|---------|---------|--------|-------------|
| | White | Blue | Green | Yellow | Orange | Red |
| HPC Services Availability | | | | | | |
| Availability in Core Time (% of time) | > 99.9% | > 99.5% | > 99.2% | > 98.5% | > 95% | 95% or less |
| Availability out of Core Time (% of time) | > 99.8% | > 99.5% | > 99.2% | > 98.5% | > 95% | 95% or less |
| Number of Failures in month | 0 | 1 | 2 to 3 | 4 | 5 | > 5 |
| Mean Time between failures in 52 week rolling period (hours) | >750 | >500 | >300 | >200 | >150 | otherwise |
| Fujitsu Service Availability | | | | | | |
| Availability in Core Time (% of time) | > 99.9% | > 99.5% | > 99.2% | > 98.5% | > 95% | 95% or less |
| Availability out of Core Time (% of time) | > 99.8% | > 99.5% | > 99.2% | > 98.5% | > 95% | 95% or less |
| Help Desk | | | | | | |
| Non In-depth Queries - Max Time to resolve 50% of all queries (working days) | < 1/4 | < 1/2 | < 1 | < 2 | < 4 | 4 or more |
| Non In-depth Queries - Max Time to resolve 95% of all queries (working days) | < 1/2 | < 1 | < 2 | < 3 | < 5 | 5 or more |
| Administrative Queries - Max Time to resolve 95% of all queries (working days) | < 1/2 | < 1 | < 2 | < 3 | < 5 | 5 or more |
| Help Desk Telephone - % of calls answered within 2 minutes | >98% | > 95% | > 90% | > 85% | > 80% | 80% or less |
| Others | | | | | | |
| Normal Media Exchange Requests - average response time (working days) | < 1/2 | < 1 | < 2 | < 3 | < 5 | 5 or more |
| New User Registration Time (working days) | < 1/2 | < 1 | < 2 | < 3 | < 4 | otherwise |
| Management Report Delivery Times (working days) | < 1 | < 5 | < 10 | < 12 | < 15 | otherwise |
| System Maintenance - no. of scheduled sessions taken per system in the month | 0 | 1 | 2 | 3 | 4 | otherwise |

Table 1

Table 2 gives actual performance information for the period of July 1st to 31st inclusive.

Overall, the CPARS Performance Achievement was good (see Table 3); i.e. Blue measured against the CPARS performance targets.

The Fujitsu availability figures are included in Table 2 but not Table 3 as they have zero weighting in CPARS terms.

CSAR Service - Service Quality Report - Actual Performance Achievement

| Service Quality Measure | 2000 | | | | | | | | | | | |
|--|--------|---------|--------|--------|--------|--------|--------|--------|-------|-------|--------|-------|
| | Aug | Sept | Aug. | Oct | Dec | Jan | Feb | March | April | May | June | July |
| HPC Services Availability | | | | | | | | | | | | |
| Availability in Core Time (% of time) | 97.20% | 100.00% | 100% | 100% | 100% | 96.11% | 95.00% | 99.70% | 100% | 100% | 99.70% | 100% |
| Availability out of Core Time (% of time) | 98.41% | 99.40 | 99.50% | 100% | 99.70% | 98.52% | 100% | 99.50% | 99.5% | 99.40 | 99.40 | 100% |
| Number of Failures in month | 5 | 1 | 1 | 0 | 1 | 4 | 1 | 2 | 1 | 1 | 2 | 0 |
| Mean Time between failures in 52 week rolling period (hours) | 416 | 416 | 437 | 534 | 563 | 230 | 515 | 486 | 437 | 515 | 461 | 461 |
| Fujitsu Service Availability | | | | | | | | | | | | |
| Availability in Core Time (% of time) | N/A | N/A | N/A | 98.30% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Availability out of Core Time (% of time) | N/A | N/A | N/A | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Help Desk | | | | | | | | | | | | |
| Non In-depth Queries - Max Time to resolve 50% of all queries | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 |
| Non In-depth Queries - Max Time to resolve 95% of all queries | <2 | <2 | <1 | <2 | <1 | <1 | <1 | <2 | <1 | <2 | <1 | <2 |
| Administrative Queries - Max Time to resolve 95% of all queries | <1 | <1 | <1 | <1 | <0.5 | <0.5 | <1 | <2 | <1 | <2 | <0.5 | <0.5 |
| Help Desk Telephone - % of calls answered within 2 minutes | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Others | | | | | | | | | | | | |
| Normal Media Exchange Requests - average response time | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New User Registration Time (working days) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Management Report Delivery Times (working days) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| System Maintenance - no. of sessions taken per system in the month | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 |

Table 2

Notes:

- HPC Services Availability has been calculated using the following formulae, based on the relative NPB performance of Turing and Fermat at installation:

$$[\text{Turing availability} \times 122 / (122 + 3.5)] + [\text{Fermat availability} \times 3.5 / (122 + 3.5)]$$
- Mean Time between failures for Service Credits is formally calculated based on a rolling 12 month period.

Table 3 gives Service Credit values for the month of July. These will be accounted on a quarterly basis, formally from the Go-Live Date. The values are calculated according to agreed Service Credit Ratings and Weightings.

CSAR Service - Service Quality Report - Service Credits

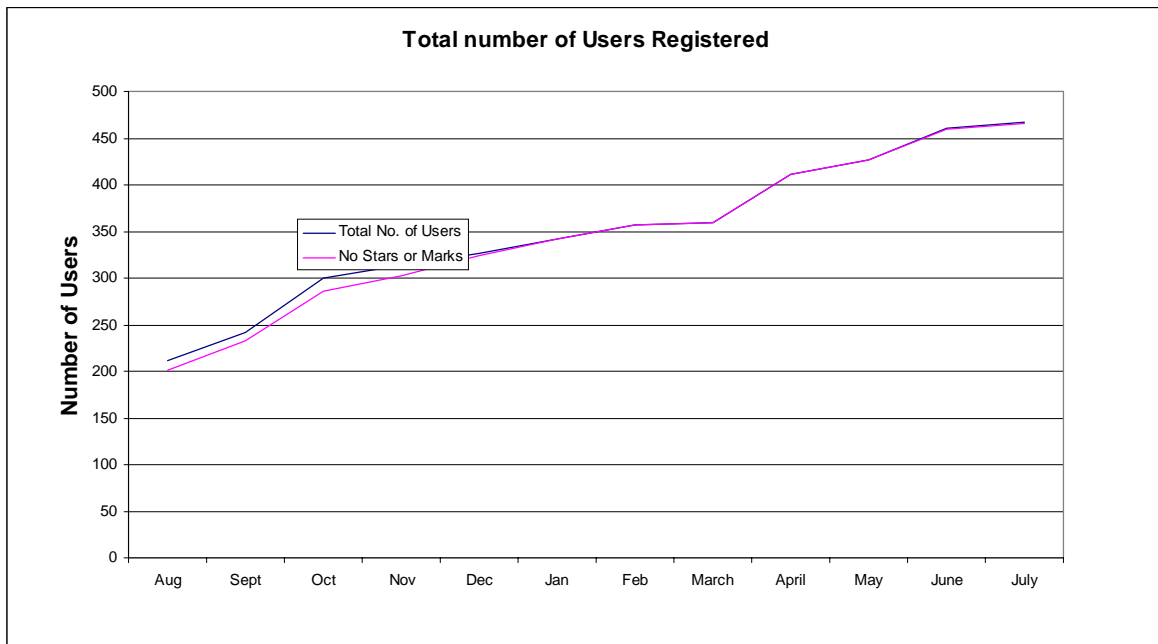
| Service Quality Measure | 2000 | | | | | | | | | | | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Aug | Sept | Sept | Nov | Dec | Jan | Feb | March | April | May | June | July |
| HPC Services Availability | | | | | | | | | | | | |
| Availability in Core Time (% of time) | 0.078 | -0.058 | -0.058 | -0.058 | -0.058 | 0.195 | 0.195 | -0.039 | -0.058 | -0.058 | -0.039 | -0.058 |
| Availability out of Core Time (% of time) | 0.039 | 0 | -0.039 | -0.047 | -0.039 | 0 | -0.047 | -0.039 | -0.039 | 0 | 0 | -0.047 |
| Number of Failures in month | 0.016 | -0.008 | -0.008 | -0.009 | -0.008 | 0.008 | -0.008 | 0 | -0.008 | -0.008 | 0 | -0.009 |
| Mean Time between failures in 52 week rolling period (hours) | 0.016 | 0 | 0 | -0.008 | -0.008 | 0.008 | -0.008 | 0 | 0 | -0.008 | 0 | 0 |
| Help Desk | | | | | | | | | | | | |
| Non In-depth Queries - Max Time to resolve 50% of all queries | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 |
| Non In-depth Queries - Max Time to resolve 95% of all queries | 0 | 0 | -0.016 | 0 | -0.016 | -0.016 | -0.016 | 0 | -0.016 | 0 | -0.016 | 0 |
| Administrative Queries - Max Time to resolve 95% of all queries | -0.016 | -0.016 | -0.016 | -0.016 | -0.019 | -0.019 | -0.016 | 0 | -0.016 | 0 | -0.019 | -0.019 |
| Help Desk Telephone - % of calls answered within 2 minutes | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 |
| Others | | | | | | | | | | | | |
| Normal Media Exchange Requests - average response time | N/A | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0 | 0 | 0 | 0 |
| New User Registration Time (working days) | 0 | 0 | 0 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 | -0.019 |
| Management Report Delivery Times (working days) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| System Maintenance - no. of sessions taken per system in the month | -0.003 | 0 | -0.003 | 0 | 0 | 0 | 0 | 0 | -0.003 | -0.003 | 0 | 0 |
| Monthly Total & overall Service Quality Rating for each period: | 0.08 | -0.05 | -0.08 | -0.09 | -0.09 | 0.07 | 0.03 | -0.06 | -0.09 | -0.06 | -0.06 | -0.09 |

Table 3

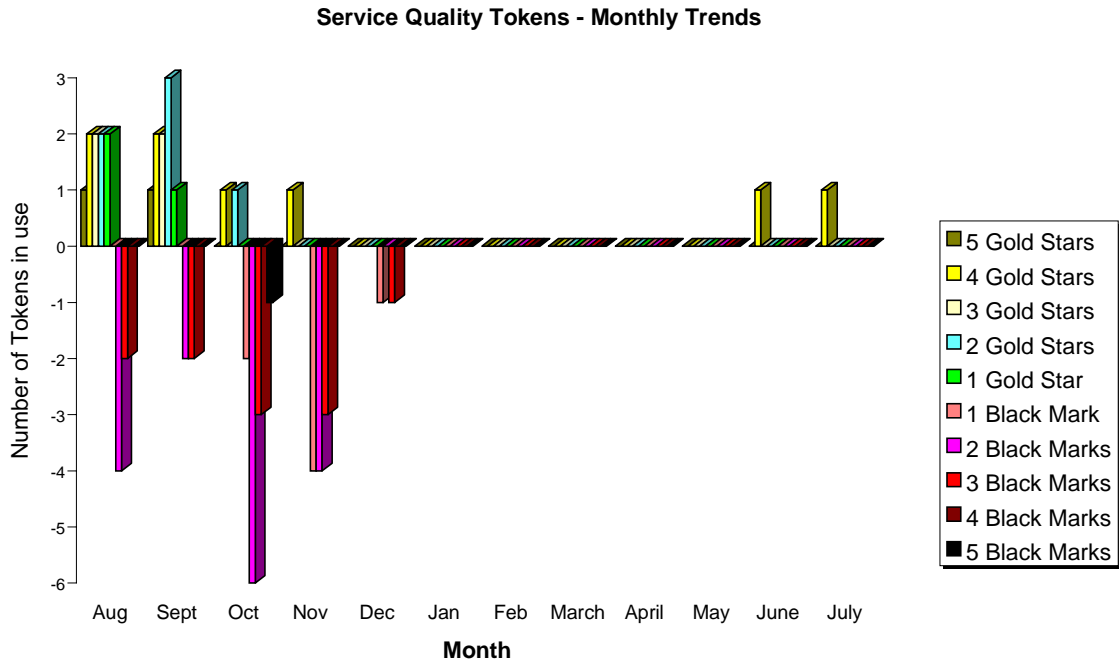
2.2 Service Quality Tokens

The current position at the end of July 2000 is that one of the 467 registered users of the CSAR Service had used Service Quality Tokens.

The graph below shows the total number of registered users on the CSAR Service and the number of users holding a neutral view of the service.



The graph below illustrates the monthly usage trend of quality tokens:



The current status is that one user has submitted 4 Gold Stars to the service.

SUMMARY OF SERVICE QUALITY TOKEN USAGE

| No of Stars or Marks | Consortia | Date Allocated | Reason Given |
|----------------------|-----------|----------------|---------------------------|
| 4 Gold Stars | CSN003 | 14/06/00 | Good Applications Support |

2.3 Throughput Target against Baseline

The Baseline Target for throughput was fully achieved this month due to plenty of work over the period. The actual usage figure was 157% of Baseline capacity.

Throughput Against Baseline CSAR Service Provision

Period: 1st to 31st July 2000

| | Baseline Capacity for Period (T3E PE Hours) | Actual Usage in Period (T3E PE Hours) | Actual % Utilisation c/w Baseline during Period |
|--|---|---|--|
| 1. Has CfS failed to deliver Baseline MPP Computing Capacity for EPSRC? | 367,726 | 578,828 | 157.41% |
| | Baseline Capacity for Period (T3E PE Hours) | Job Time Demands in Period | Job Demand above 110% of Baseline during Period (Yes/No)? |
| 2. Have Users submitted work demanding > 110% of the Baseline during period? | 367,726 | 580,194 | Yes |
| | | Number of Jobs at least 4 days old at end Period | Number of Jobs at least 4 days old at end Period is not zero (Yes/No)? |
| 3. Are there User Jobs outstanding at the end of the period over 4 days old? | | 18 | Yes |
| | | Minimum Job Time Demands as % of Baseline during Period | Minimum Job Time Demand above 90% of Baseline during Period (Yes/No)? |
| 4. Have Users submitted work demands above 90% of the Baseline during period? | | 158% | Yes |
| | Number of standard Job Queues (ignoring priorities) | Average % of time each queue contained jobs in the Period | Average % of time each queue contained jobs in the Period is > 97%? |
| 5. Majority of Job Queues contained jobs from Users for more than 97% during period? | 4 | 89.7% | No |

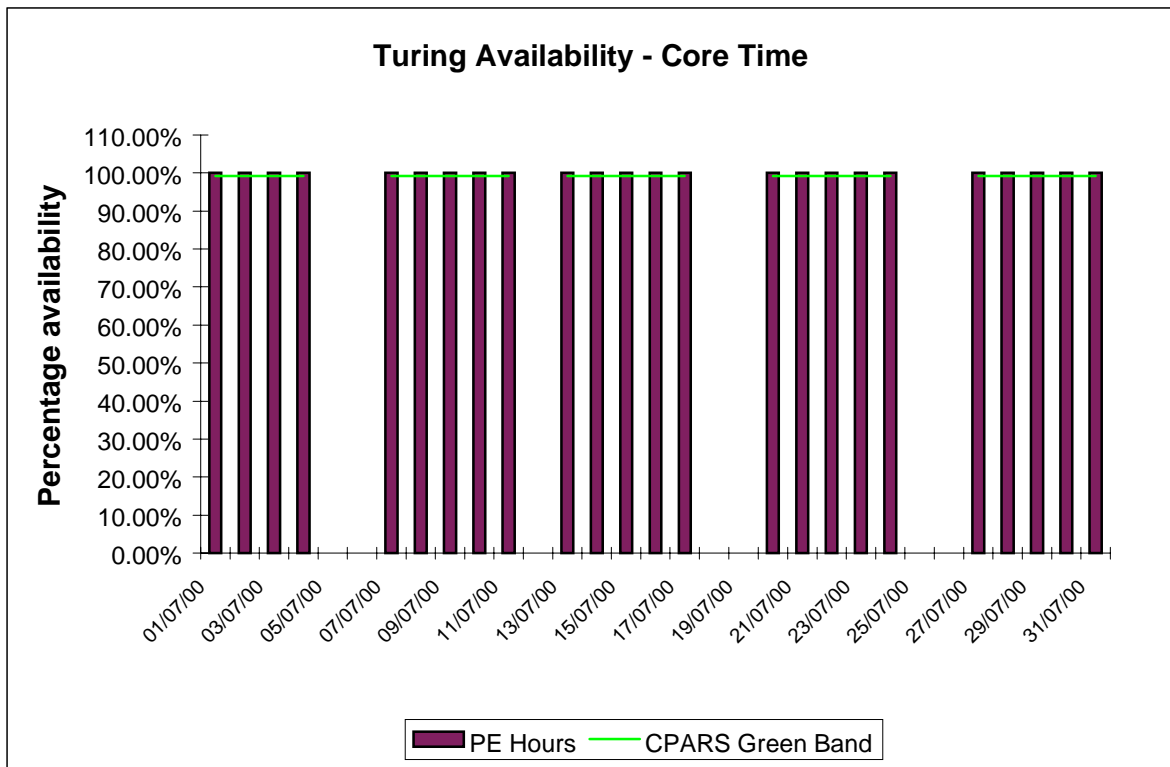
3. System Availability

Service availability each reporting period is calculated as a percentage of actual availability time over theoretical maximum time, after accounting for planned breaks in service for preventative maintenance.

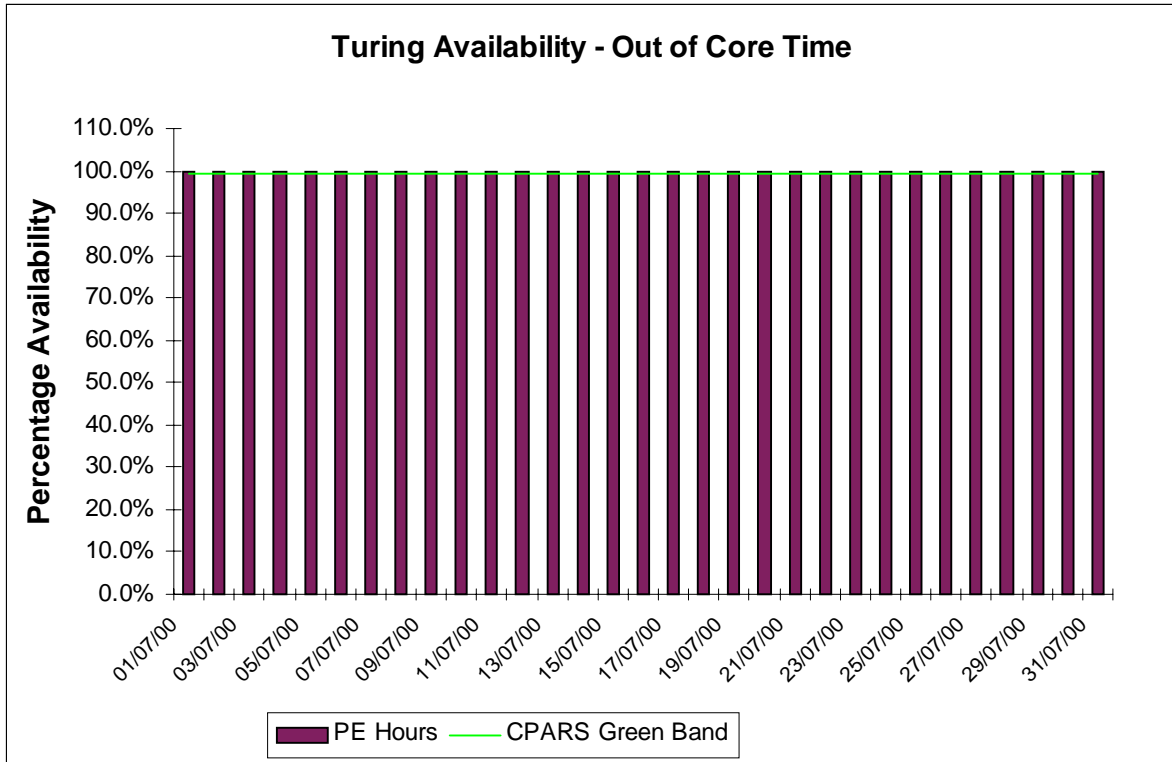
3.1 Cray T3E-1200E System (Turing)

The following graphs show the availability of Turing both in core time and out of core time respectively during the period of 1st to 31st July.

Turing availability for July:



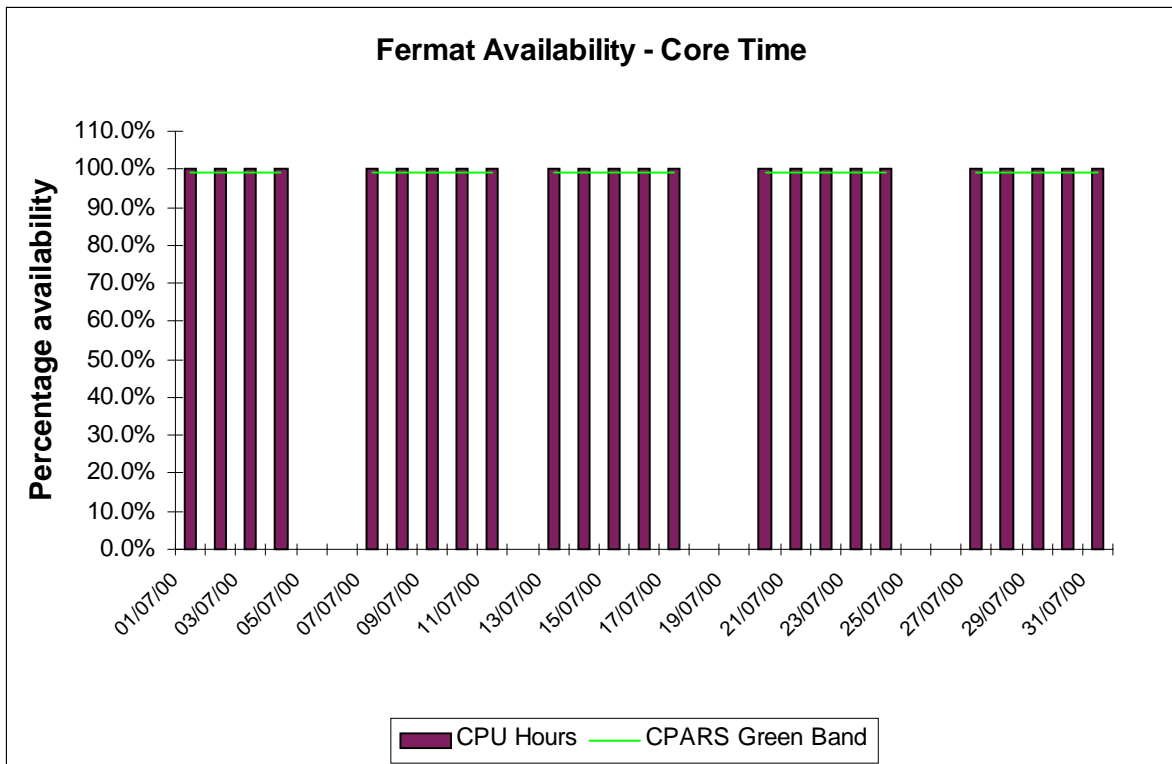
Availability of Turing in core time during July was excellent.



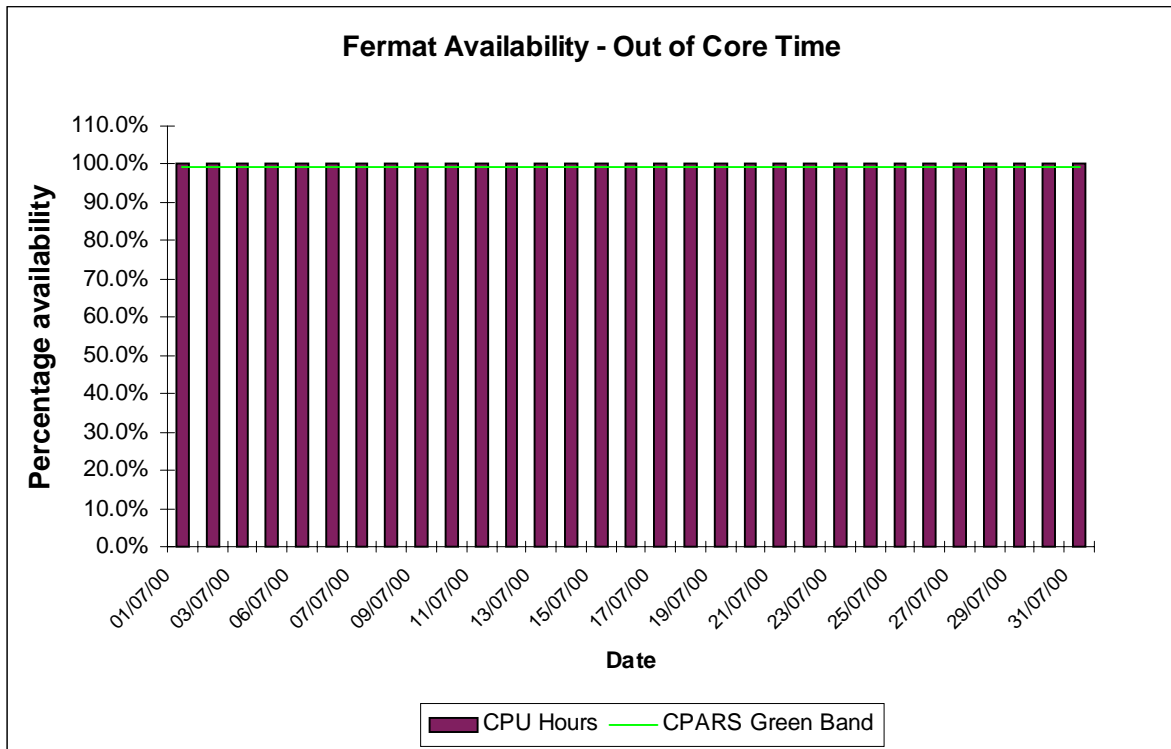
Availability of Turing out of core time during July was excellent.

3.2 SGI Origin2000 System (Fermat)

The following graphs show the availability of Fermat both in core time and out of core time respectively.



Availability of Fermat in core time during July was excellent.



Availability of Fermat out of core time during July was excellent.

4. HPC Services Usage

Usage information is given in tabular form, in Appendices, and in graphical format. The system usage information for the period of July 1st to 31st is provided by Project/User Group, totalled by Research Council and overall. This covers:

- CPU usage Turing: 578,828 PE Hours Fermat: 4,015.43 CPU Hours
- User Disk allocation Turing: 50.70 GB Years Fermat: 17.70 GB Years
- HSM/tape usage 848.53 GB Years

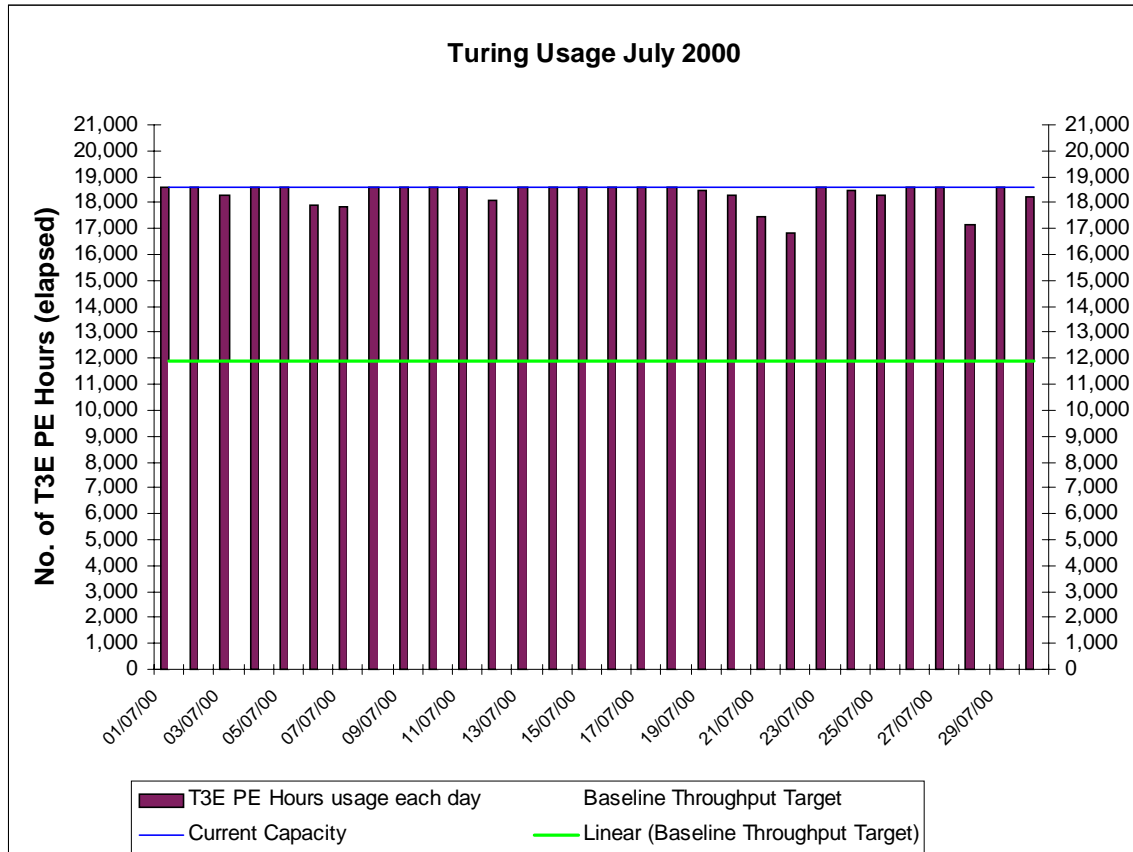
In addition, the following graphs are provided to illustrate usage per month, historically:

- a) MPP (T3E) Usage by month, showing usage each month of CPU (T3E PE Elapsed Hours), split by Research Council and giving the equivalent GFLOP-Years as per NPB. The Baseline is shown by an overlaid horizontal line.
- b) SMP (Origin) Usage by month, showing usage each month in CPU Hours, split by Research Council and giving the equivalent GFLOP-Years as per NPB. The Baseline Capacity is shown by an overlaid horizontal line.
- c) High Performance Disk (T3E) allocated for User Data by month, showing the allocated space each month in GBytes, split by Research Council. The Baseline Capacity (1 Terabyte) is shown by an overlaid horizontal line.
- d) Medium Performance Disk (Origin) allocated for User Data by month, showing the allocated space each month in GBytes, split by Research Council. The Baseline Capacity (1.5 Terabytes) is shown by an overlaid horizontal line.
- e) HSM/Tape Usage (T3E) by month, showing the volumes held each in GBytes, split by Research Council. The Baseline Capacity (16 Terabytes) available will be shown by an overlaid horizontal line.

4.1 Cray T3E-1200E System (Turing)

The following graph shows the usage of Turing during each day of July 2000. Note that there is some variance on a day-to-day basis as the accounts record job times, and thus CPU usage figures, at the time of job completion which could be the second actual day for large jobs. At present, there is a 12 hour limit on jobs, so that they are check-pointed, and computational time lost due to any failure is well managed.

Turing usage for July:



The above usage graph for the Turing system shows that the overall workload was variable, though as can be seen from the graph there were fewer periods with low work volumes.

The above graph also indicates the workload reached 100% of maximum theoretical capacity for a large part of the month.

Fine tuning of the CfS scheduling system will continue to ensure minimal wasting of PE resource, in order to fit in a number of different sized jobs (e.g. 32, 64, 128, 256) thus facilitating maximised job throughput.

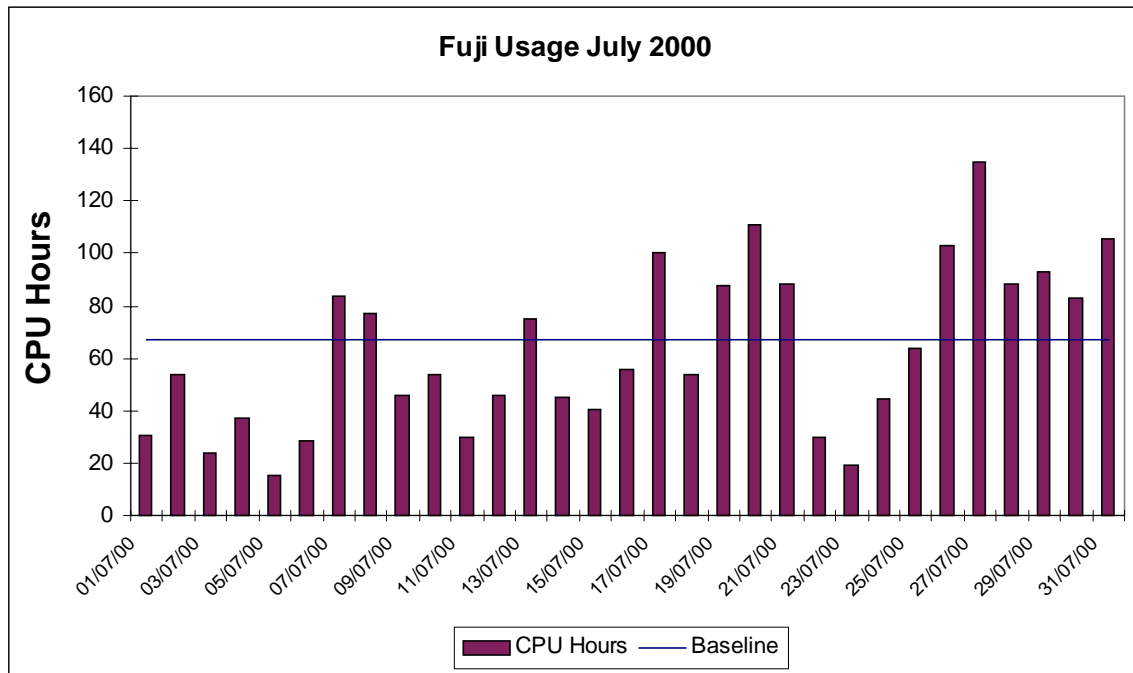
In particular, Turing will continue to start large jobs above 256 PEs, including 512 PEs, every night they are queued subject to the overall workload.

4.2 SGI Origin2000 System (Fermat)

The usage of the Origin system was low for the month with the daily usage of the system averaging only 33% of theoretical maximum. This figure does not show that in some periods CPU time is running at 99.9% of the total available CPU time. The groups most heavily using the Fermat system are CSE009 (Catlow), CSN001 (Webb) and CSE003 (O'Neill).



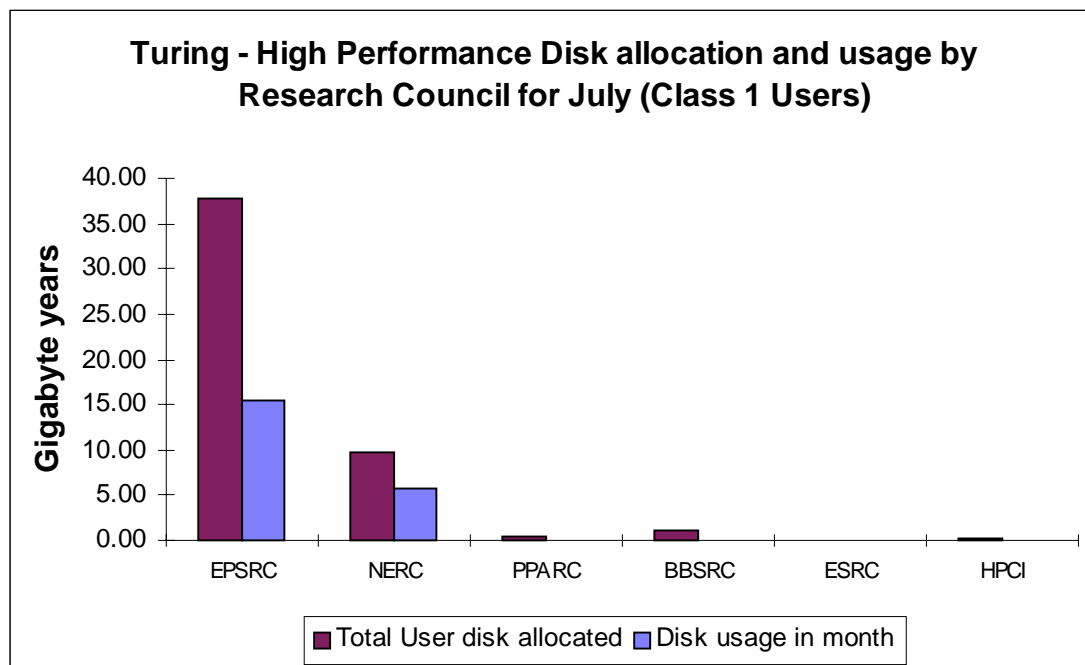
4.2.1 Fujitsu VPP 300/8 System (Fuji)



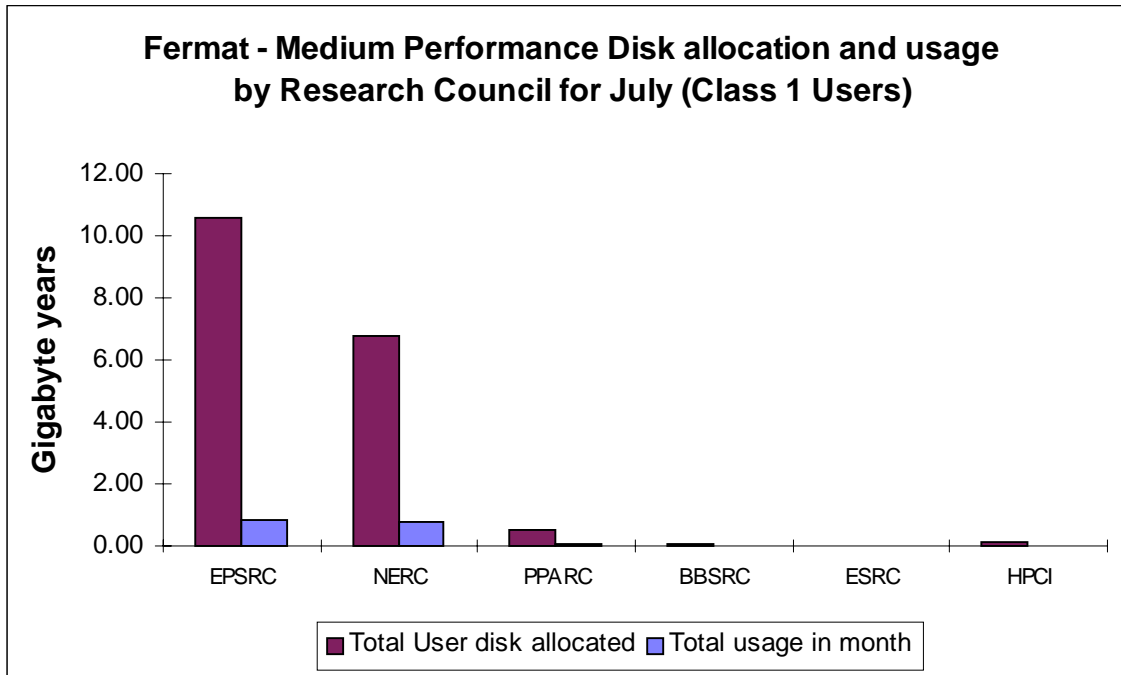
Utilisation of the Fujitsu system was variable this month, with the overall utilisation being 93% of Baseline.

4.3 Disk/HSM Usage Charts

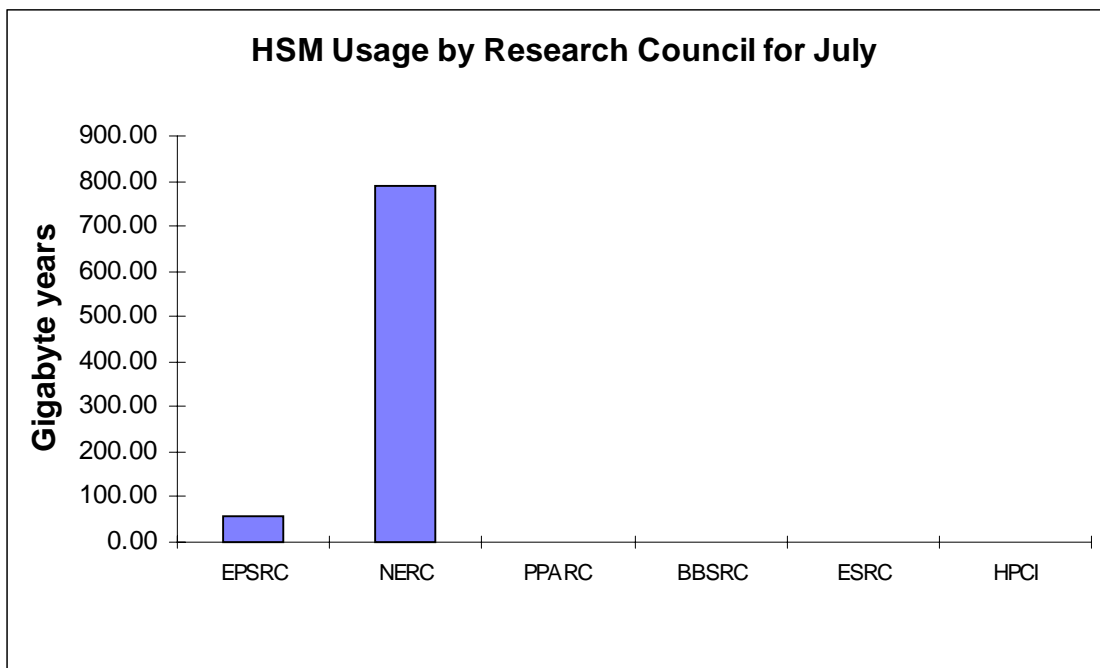
The graphs below show current disk and HSM allocations and usage.



The preceding graph shows actual usage on average against the current allocation of disk on the Turing system.

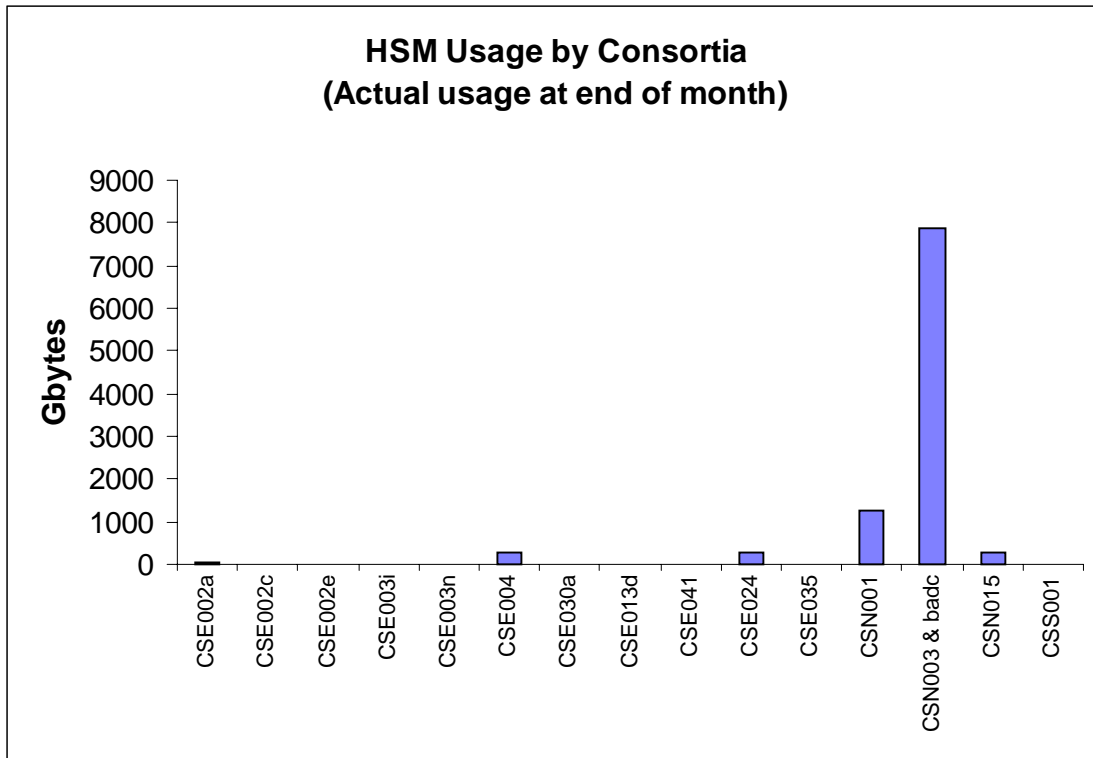


The above graph shows the disk allocations against usage on average of the disk on Fermat.

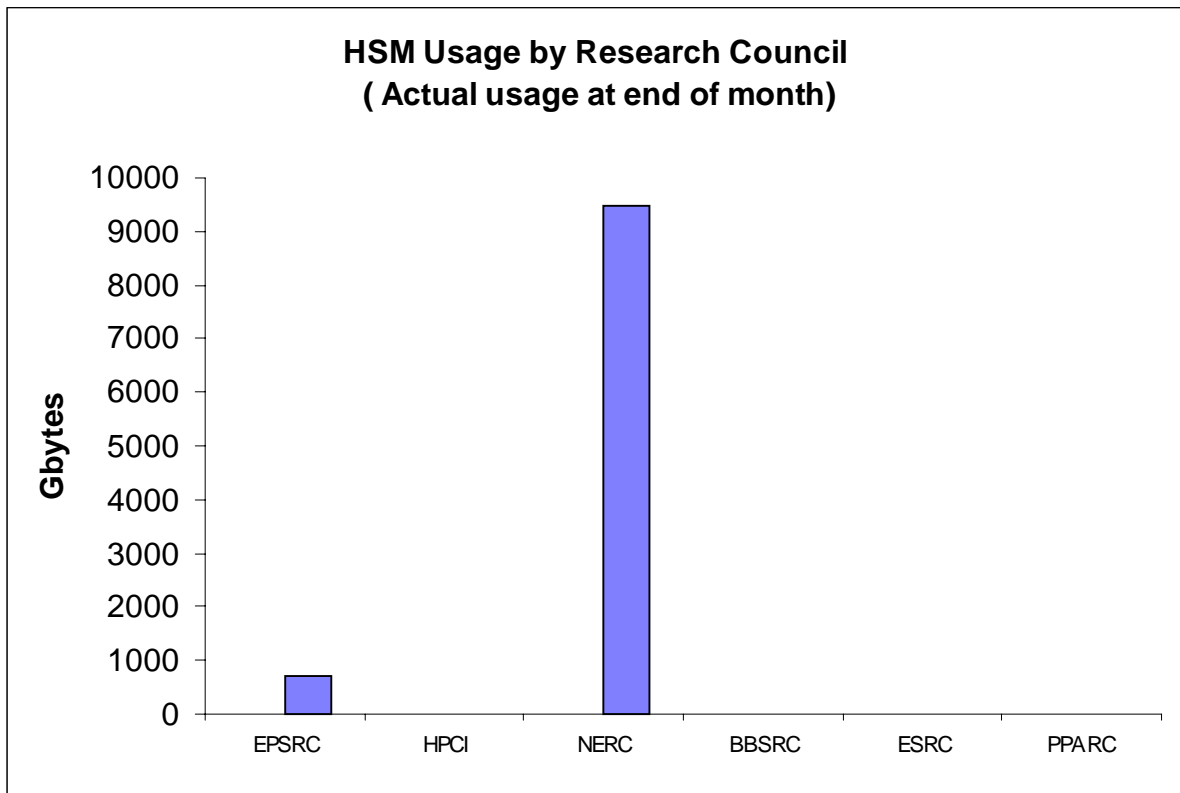


The above graph shows the total usage of the HSM facility by Research Council.

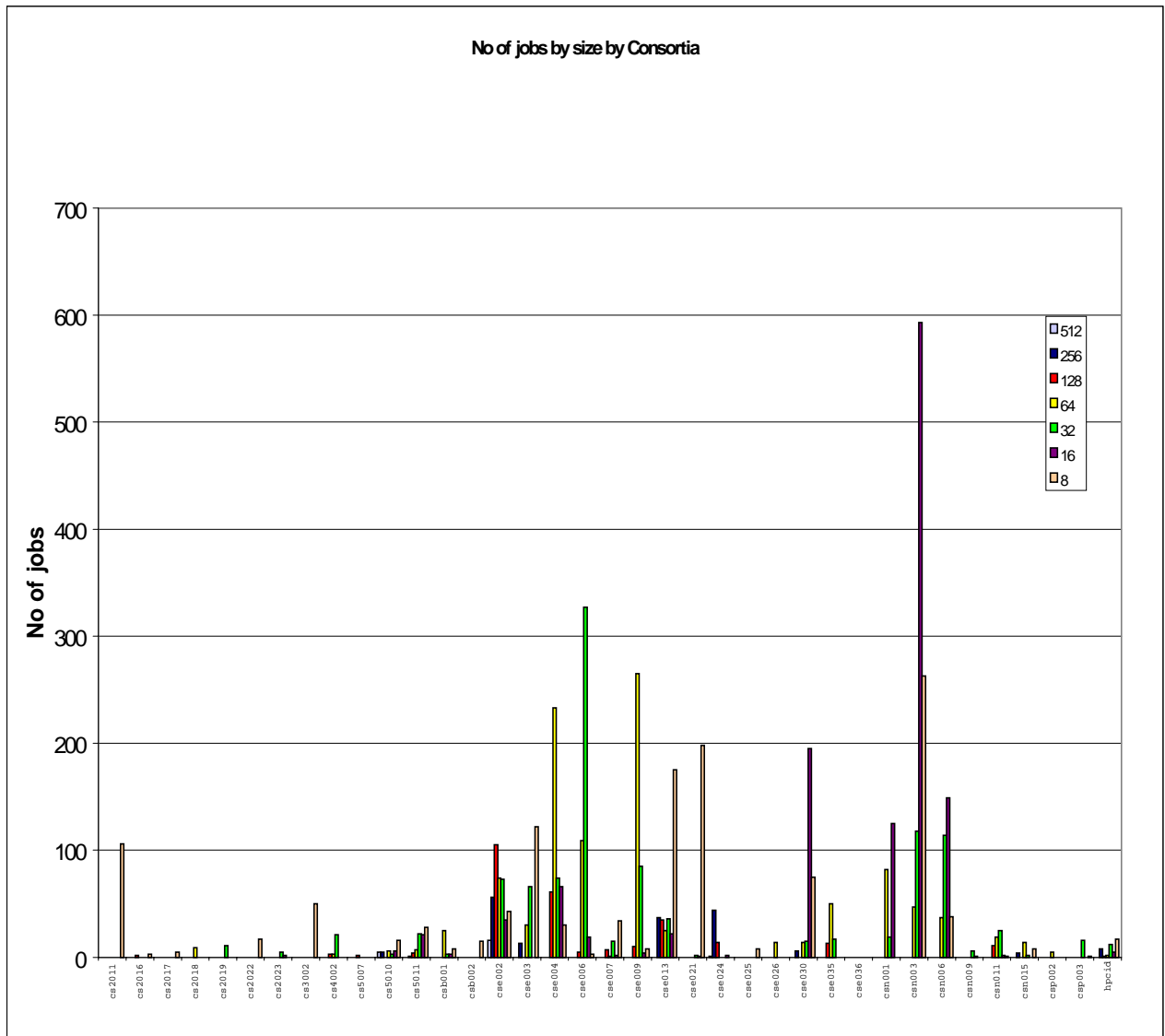
The next two graphs give actual usage of HSM by Research Council and by Consortium.



CSE002 (Gillan), CSE004 (Sandham), CSE024 (Tennyson), CSN001 (Webb) & CSN003 (O'Neill).

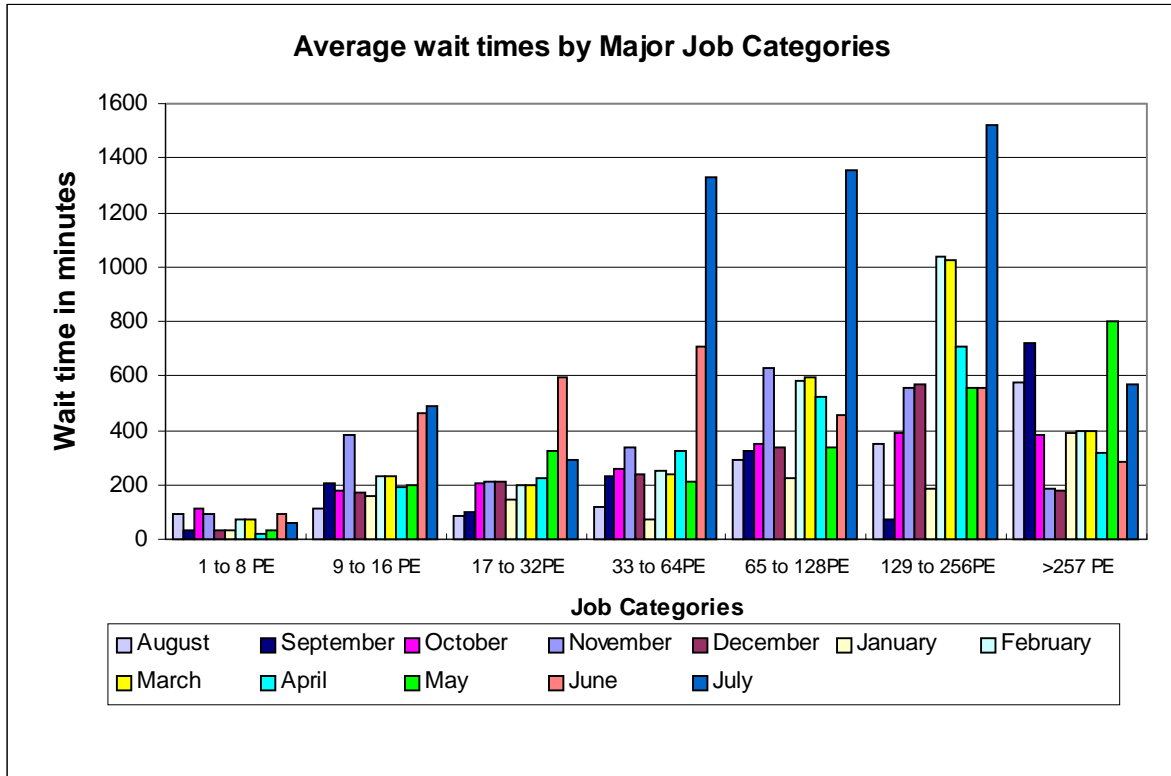


Job statistics for Turing:

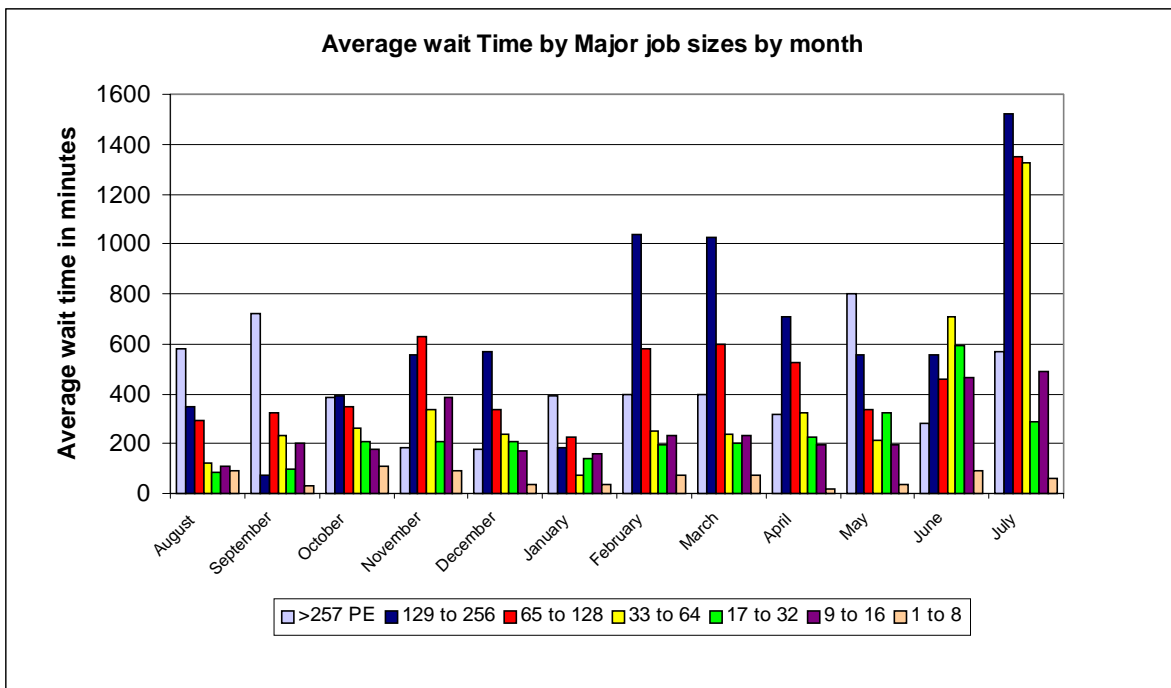


The above graph shows the number of jobs of the major sizes run in the period 1st to 31st July 2000.

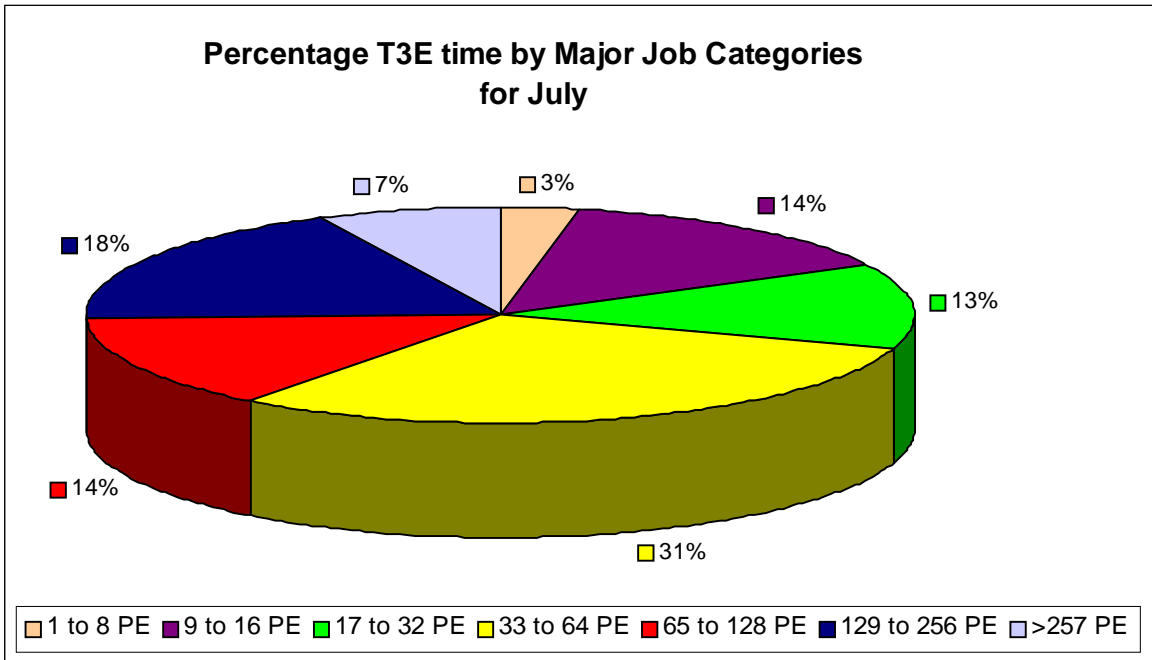
The next graph shows the wait times in minutes for the major categories of jobs.



The chart above shows the average wait time trend over the last 12 months. Wait times for jobs in the range of 33 to 256 PE's are continuing to grow due to the heavy workload on the system.

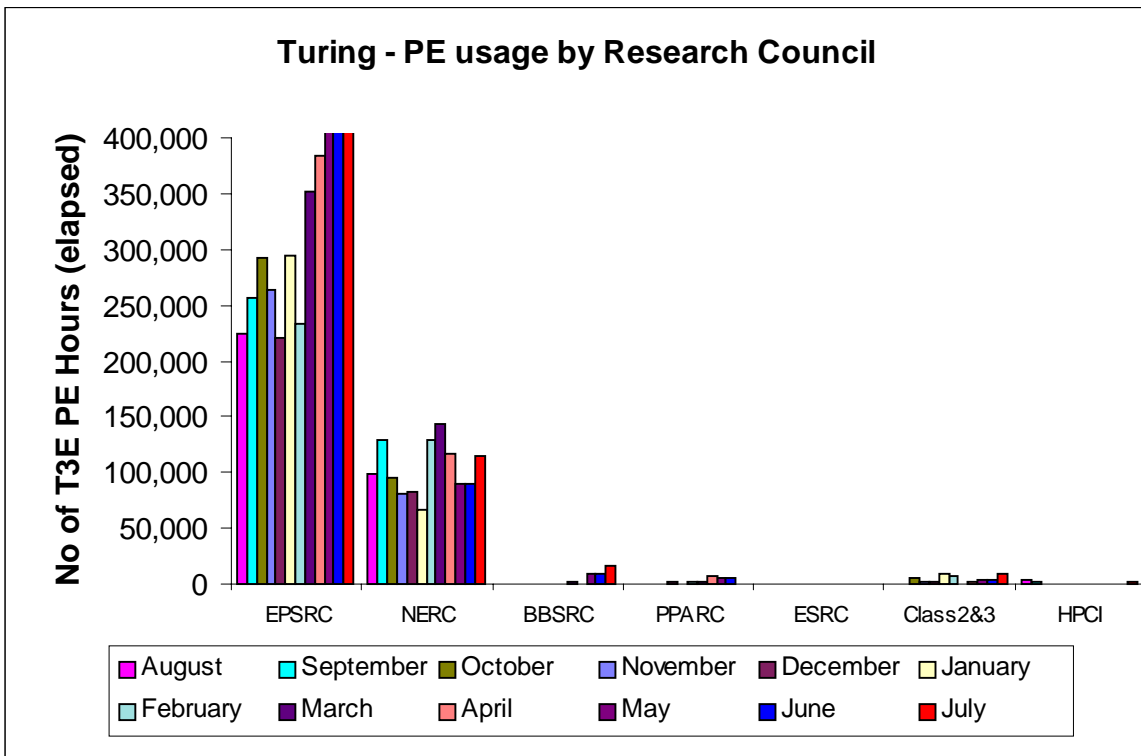


It can be seen from the above graph that enhancements to the scheduling on Turing did reduce the average wait times but attention must now be paid to ensure sufficient head room exists in the system to bring the currently long wait times back to reasonable levels.

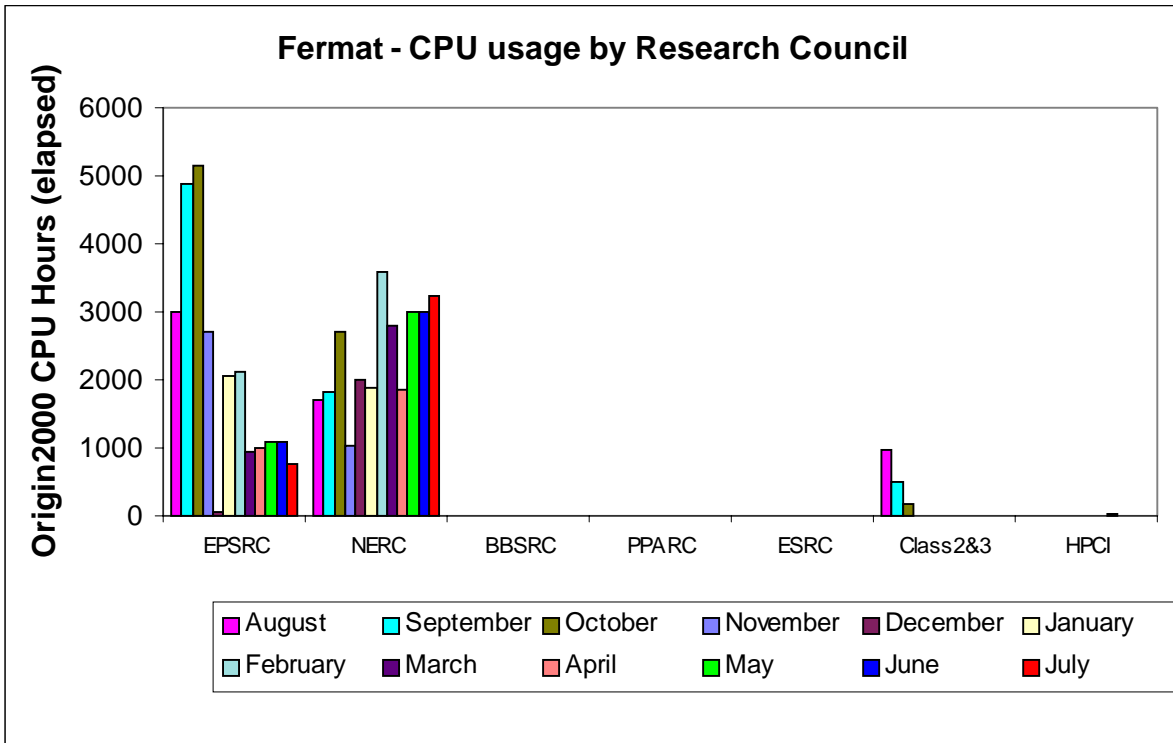


The average job size in the month of July showed a continued increase in the volume of jobs being greater than 32 PE's in size. The figure for July is 70%, an increase of 9% over last month.

Encouragingly, 7% of the compute capacity of Turing was used for jobs requiring more than 256 PE's – a new high for the CSAR Service.



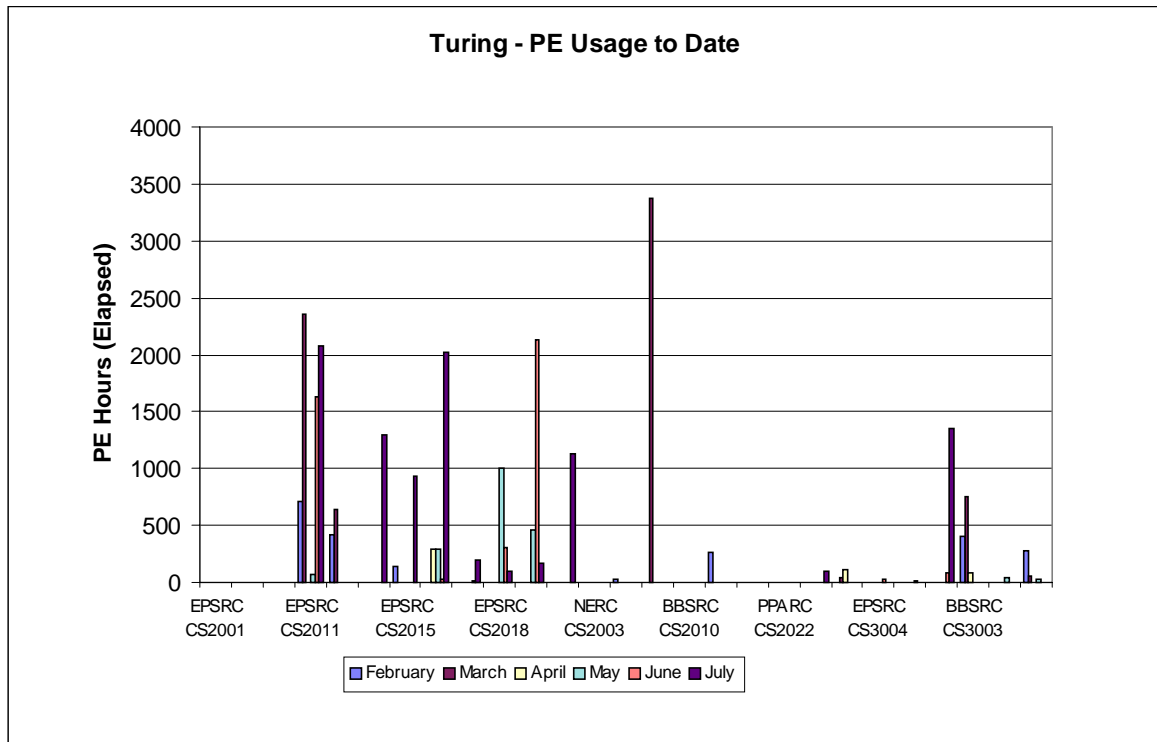
Turing PE usage is shown by Research Council during the past 12 months of service in the above chart.



Origin 2000 CPU usage is shown by Research Council during the past 12 months of service in the above chart.

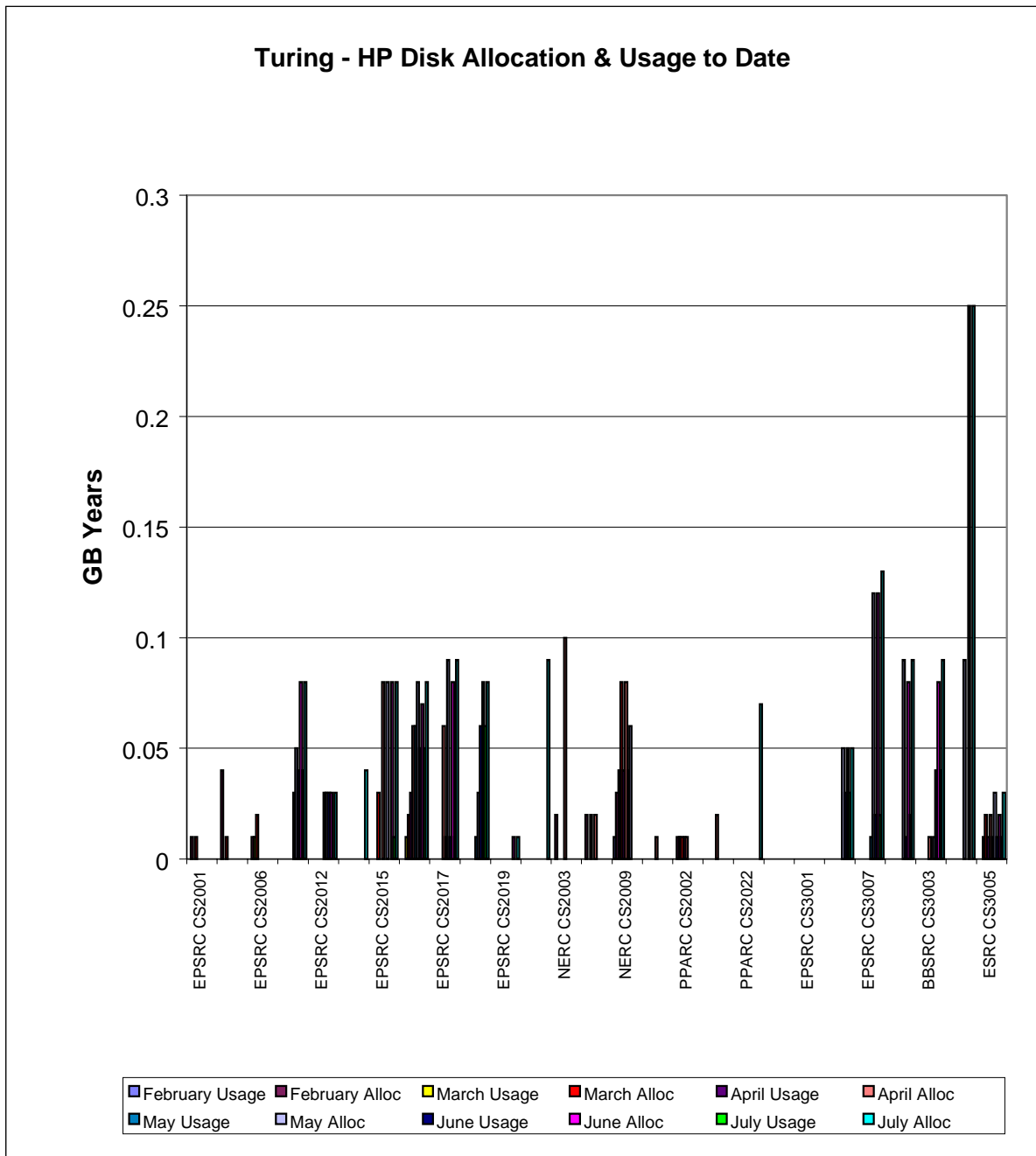
4.4 Class 2 & 3 Usage Charts

The next series of charts show the usage of the system by the class 2 & class 3 users. The usage is shown by project and identifies the Research Council of the individual projects.

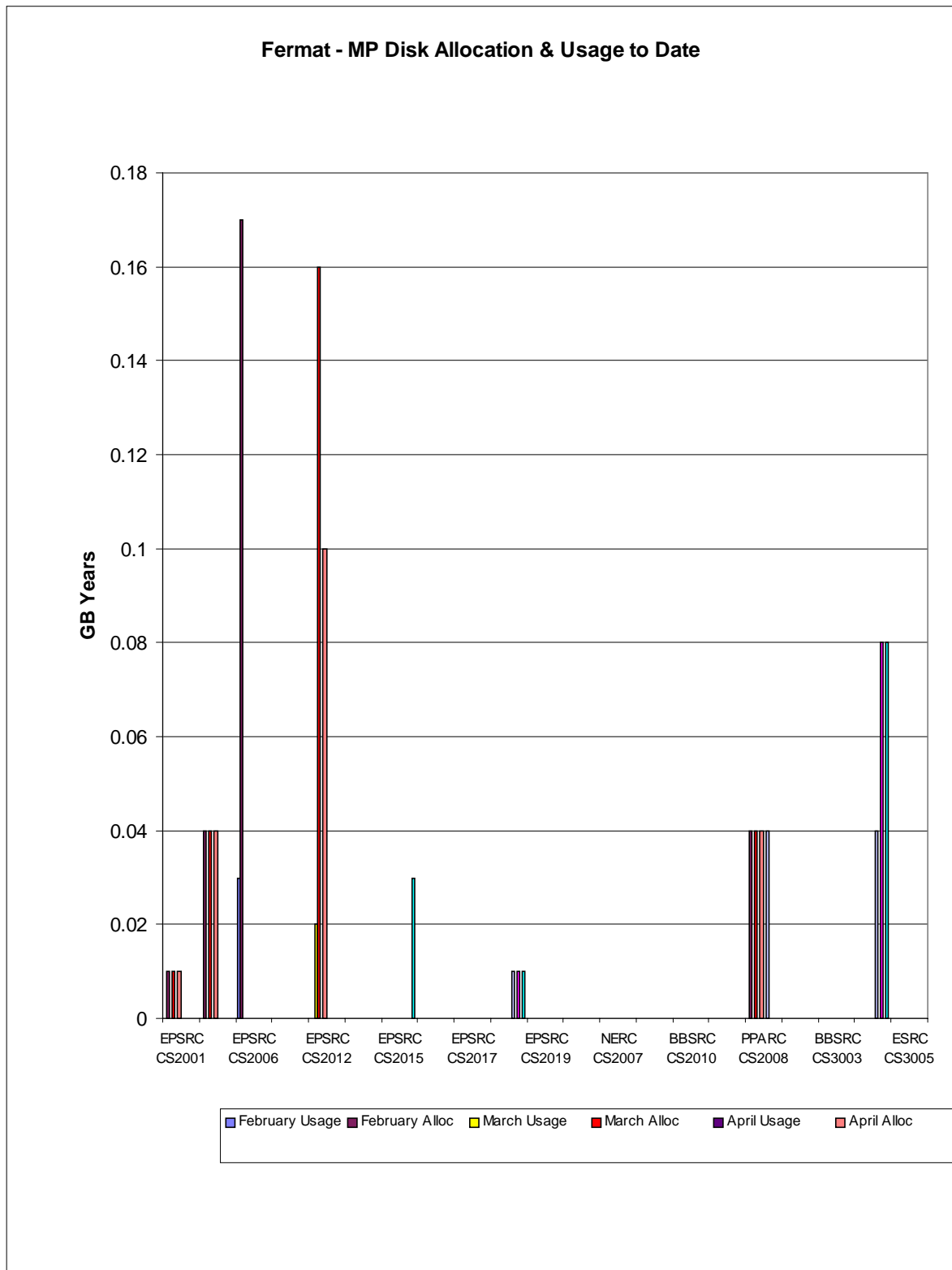


The above chart shows the most significant PE usage of the Turing system by class 2 and class 3 users.

The chart showing the CPU usage of the Fermat system by class 2 and class 3 users, has not been included due to zero usage.



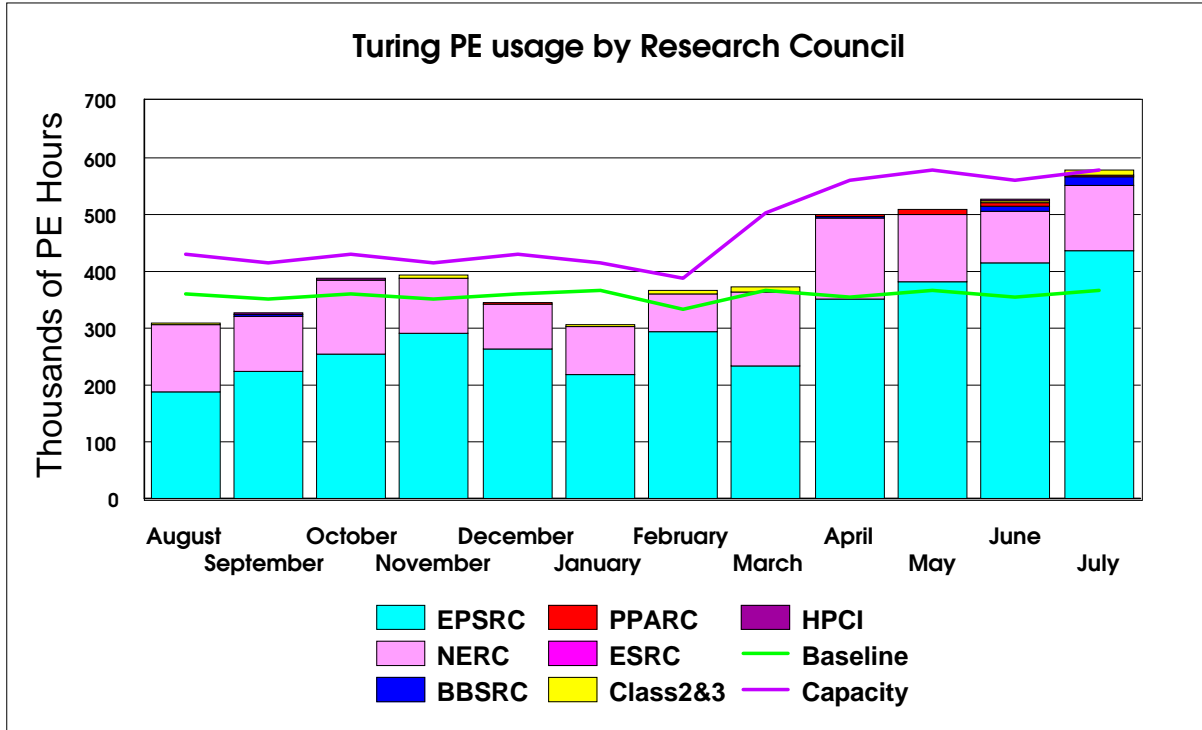
The above chart shows the most significant disk allocations on the Turing system for class 2 and class 3 users.



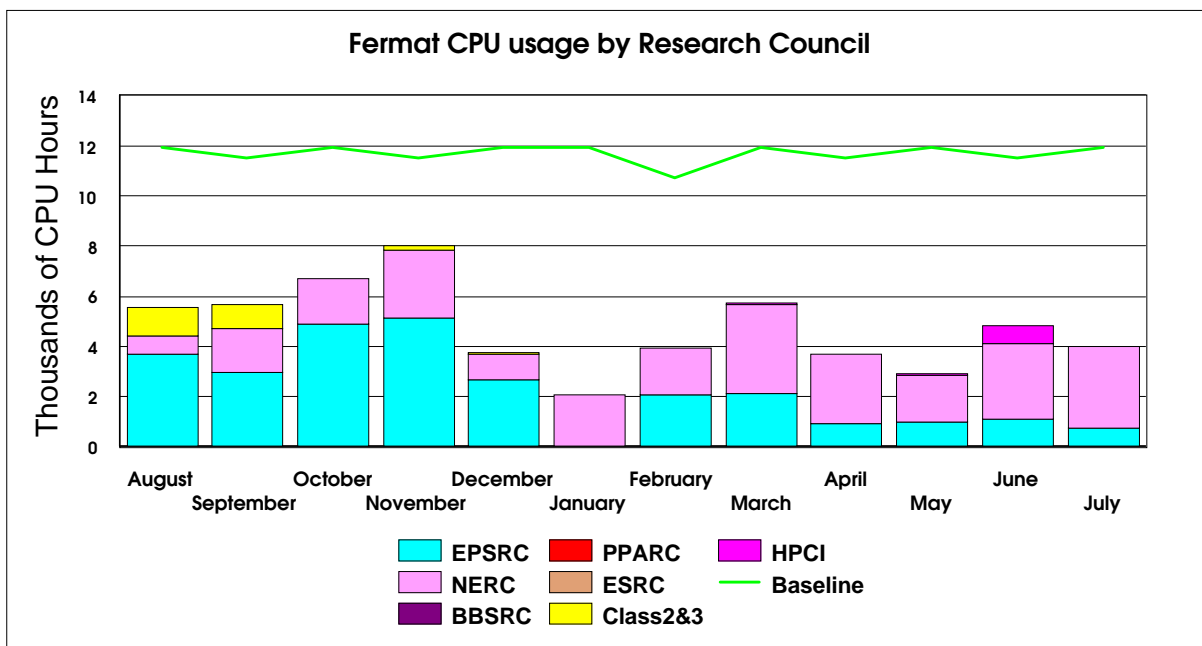
4.5 Charts of Historical Usage

In all the Usage Charts, the baseline varies dependant on the number of days in each month, within a 365-day year.

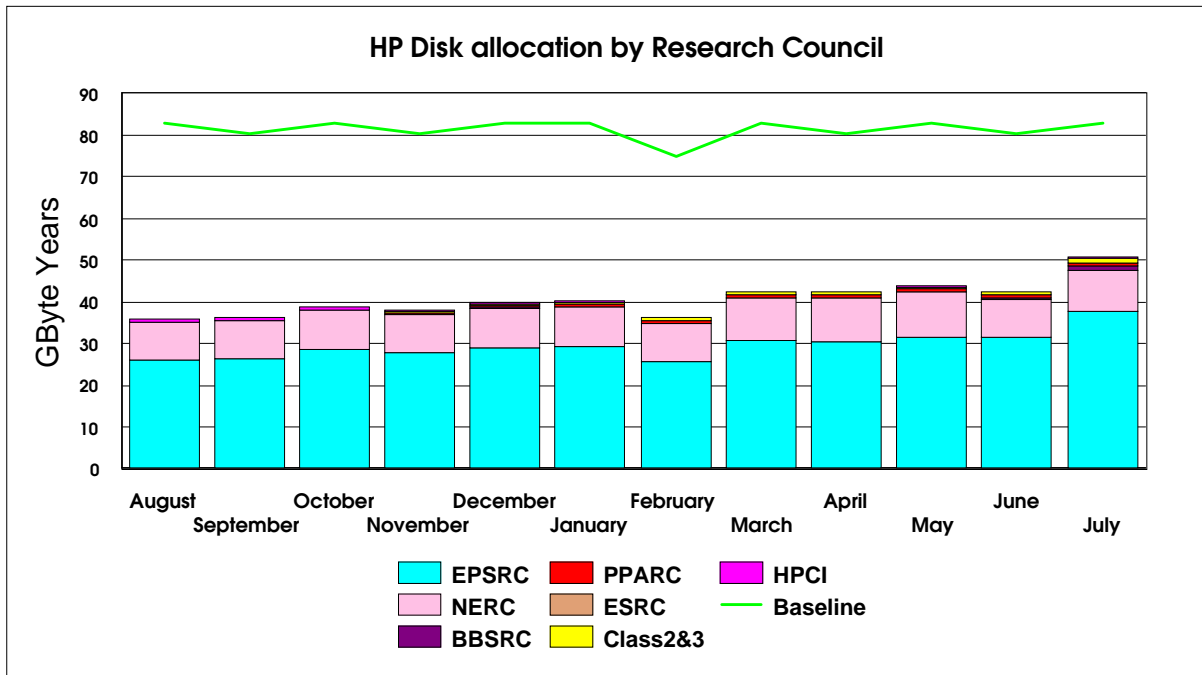
The graph below shows the PE hour's utilisation on Turing by Research Council for the previous 12 months.



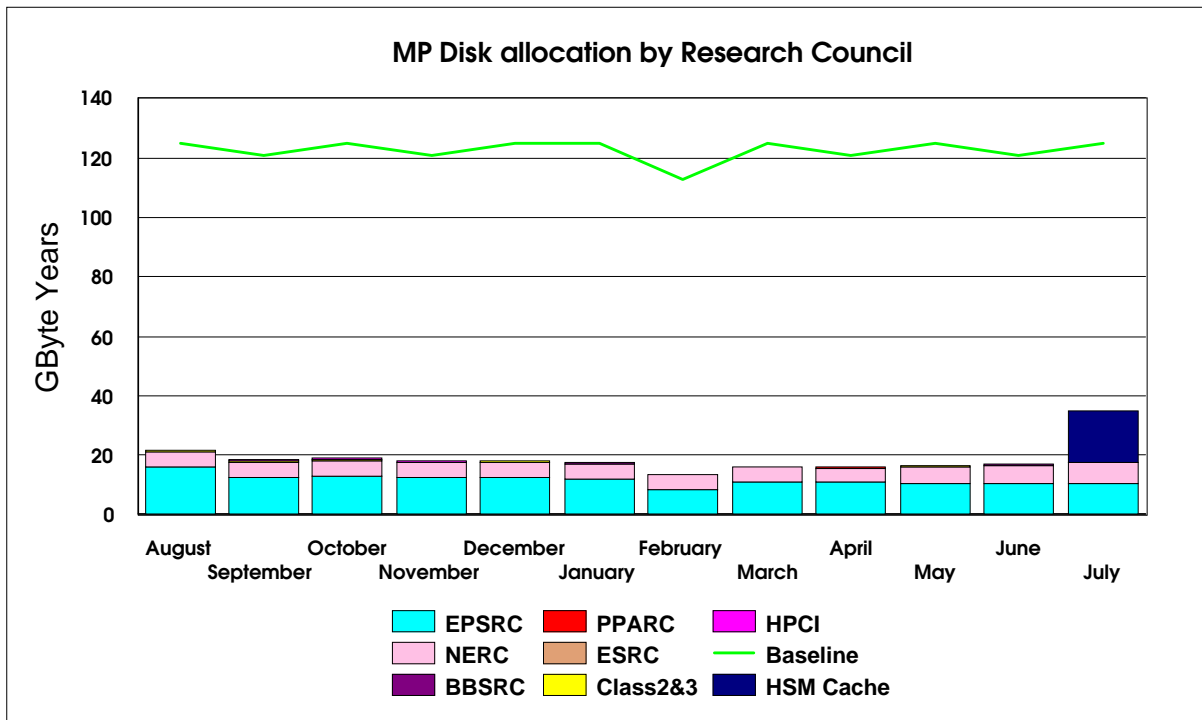
The graph below shows the historic CPU usage on Fermat by Research Council for the previous 12 months.



The next series of graphs illustrates the usage of the disk and HSM resources of the system.

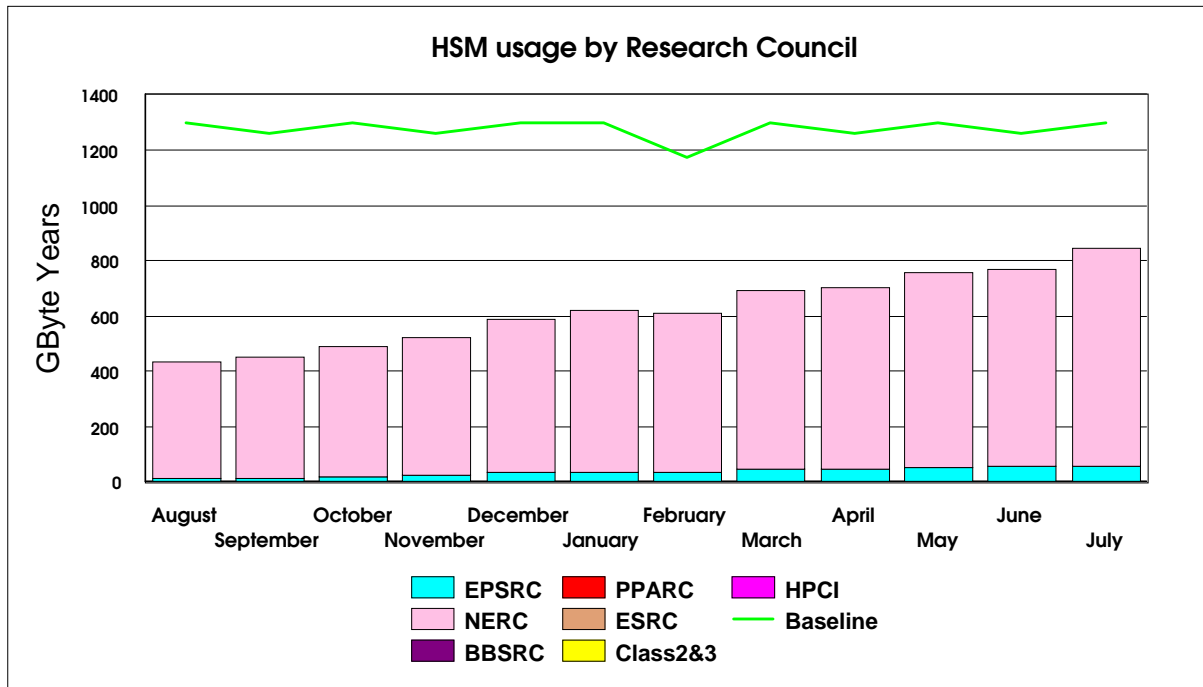


The preceding graph illustrates the historic allocation of the High Performance Disk on Turing.

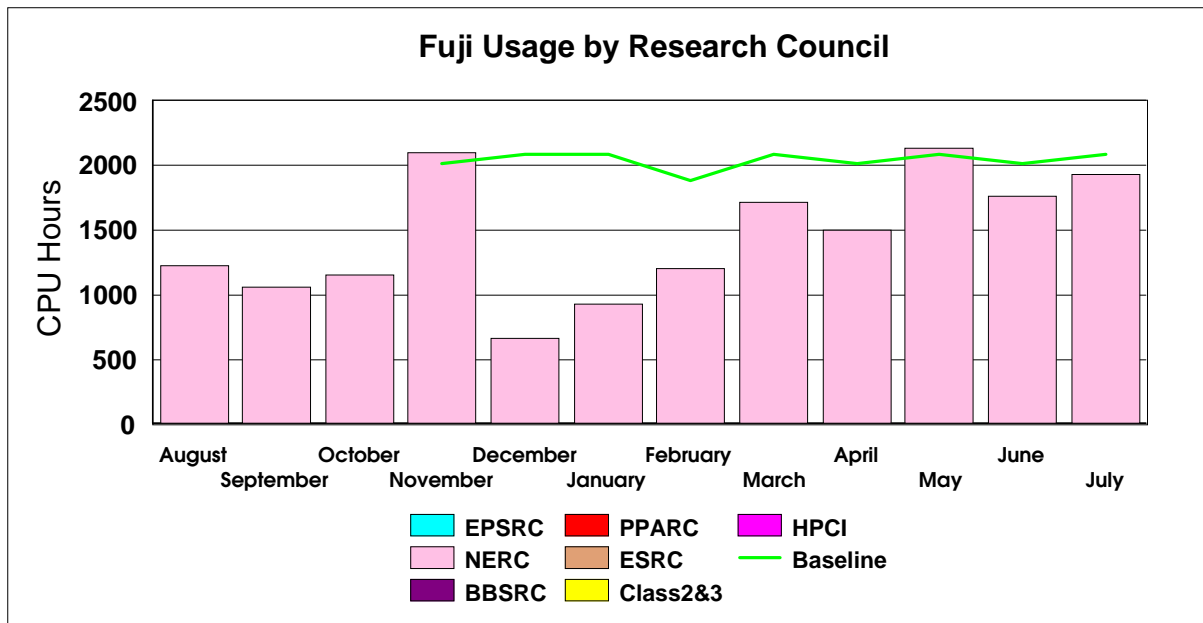


The graph above illustrates the historic allocation of the Medium Performance Disk on Fermat.

The graph below shows the historic HSM usage by Research Council funded projects. The primary usage is for NERC.



The next chart shows the historic usage of the Fuji system.



The Fujitsu system was under utilised compared against the baseline, however the usage trend is showing an upturn in general usage.

4.5 Guest System Usage Charts

There are currently no Guest machines available to the CSAR Service.

5. Service Status, Issues and Plans

5.1 Status

The service has run above baseline since the 200 PE upgrade was carried out in March.

During the month, 70% of the jobs run on Turing were larger than 32 PEs in size.

5.2 Issues

Wait times are growing with increasing demands for the services. A capacity planning review has been carried out, this indicates that an additional 280 T3E PE equivalents are required to meet the users planned requirements. It is planned to meet the increasing demands by introducing the IA-64 “ cluster “ to be known as Fourier, new Guest systems and, possibly, an SGI Origin 3000.

5.3 Plans

Plans to provide Guest systems to the service are progressing with an HP N Series soon to be available based at CSC’s Maidstone Data Centre. A Compaq EV-67 based cluster is planned to be installed at UoM by the end of August, for usage from September.

Discussions are currently underway with SGI over plans to upgrade the current Origin 2000 (Fermat) to a larger Origin 3000 system.

6. Conclusion

July 2000 saw the overall CPARS rating at Blue.

The baseline was exceeded by over 57% with the largest proportion of the workload being the larger job sizes.

Continued management attention will be given to maximise the throughput of the Service, whilst balancing as fairly as practicable the shares between Projects and jobs of the varying sizes.

Appendix 1 contains the accounts for July 2000

Appendix 2 contains the Percentage shares by Consortium for July 2000

Appendix 3 contains the Percentage shares by Research Council for July 2000

Appendix 4(h)10.1(e Percen)10.1(t)5(a)2.3(g)10.1(e)2.w [(Append (t)5(orcen)10.1(t)5(a)2.3(g)10.1(e)2.3(s)7(e)1.9(s)7.2(ear21.

Appendix 1

The summary accounts for the month of July 2000 can be found at the URL below

<http://www.csar.cfs.ac.uk/admin/accounts/summary.shtml>

Appendix 2

| Percentage PE time per consortia for Turing in July 2000 | | Percentage CPU time per consortia for Fermat in July 2000 | |
|--|----------------|---|----------------|
| Consortia | % Machine Time | Consortia | % Machine Time |
| CSE002 | 18.70 | CSE002 | 0.07 |
| CSE003 | 3.37 | CSE003 | 0.00 |
| CSE007 | 1.14 | CSE007 | 0.00 |
| CSE021 | 0.33 | CSE021 | 0.00 |
| CSE023 | 0.00 | CSE023 | 0.00 |
| CSE025 | 0.12 | CSE025 | 0.00 |
| CSE030 | 5.73 | CSE030 | 2.80 |
| CSE006 | 15.39 | CSE006 | 0.00 |
| CSE026 | 1.00 | CSE026 | 0.00 |
| CSE004 | 9.47 | CSE004 | 0.03 |
| CSE010 | 0.00 | CSE010 | 0.00 |
| CSE011 | 0.00 | CSE011 | 0.00 |
| CSE013 | 7.10 | CSE013 | 0.00 |
| CSE014 | 0.00 | CSE014 | 0.00 |
| CSE016 | 0.00 | CSE016 | 0.00 |
| CSE018 | 0.00 | CSE018 | 0.00 |
| CSE022 | 0.00 | CSE022 | 0.00 |
| CSE027 | 0.00 | CSE027 | 0.00 |
| CSE029 | 0.00 | CSE029 | 0.00 |
| CSE040 | 0.00 | CSE040 | 0.00 |
| CSE041 | 0.00 | CSE041 | 2.27 |
| CSE008 | 0.00 | CSE008 | 0.00 |
| CSE009 | 4.87 | CSE009 | 13.67 |
| CSE024 | 3.62 | CSE024 | 0.01 |
| CSE033 | 0.00 | CSE033 | 0.00 |
| CSE035 | 4.51 | CSE035 | 0.00 |
| CSE019 | 0.00 | CSE019 | 0.00 |
| CSE020 | 0.00 | CSE020 | 0.00 |
| CSE034 | 0.00 | CSE034 | 0.00 |
| CSE036 | 0.00 | CSE036 | 0.11 |
| HPCI Southampton | 0.00 | HPCI Southampton | 0.00 |
| HPCI Daresbury | 0.37 | HPCI Daresbury | 0.00 |
| HPCI Edinburgh | 0.00 | HPCI Edinburgh | 0.00 |
| CSN001 | 4.61 | CSN001 | 66.95 |
| CSN002 | 0.00 | CSN002 | 0.00 |
| BADC | 0.00 | BADC | 0.00 |
| CSN003 | 7.70 | CSN003 | 13.93 |
| CSN005 | 0.00 | CSN005 | 0.00 |
| CSN006 | 5.15 | CSN006 | 0.00 |
| CSN007 | 0.00 | CSN007 | 0.00 |
| CSN009 | 0.00 | CSN009 | 0.00 |
| CSN010 | 0.00 | CSN010 | 0.00 |
| CSN011 | 0.37 | CSN011 | 0.00 |
| CSN012 | 0.00 | CSN012 | 0.00 |
| CSN013 | 0.01 | CSN013 | 0.00 |
| CSN015 | 2.07 | CSN015 | 0.01 |
| CSN017 | 0.00 | CSN017 | 0.00 |
| CSB001 | 2.69 | CSB001 | 0.00 |
| CSB002 | 0.00 | CSB002 | 0.00 |
| CSB003 | 0.00 | CSB003 | 0.00 |
| CSP002 | 0.01 | CSP002 | 0.00 |
| CSP003 | 0.09 | CSP003 | 0.04 |
| CSS001 | 0.00 | CSS001 | 0.00 |
| CSS002 | 0.00 | CSS002 | 0.00 |
| CS2001 | 0.00 | CS2001 | 0.00 |
| CS2002 | 0.00 | CS2002 | 0.00 |
| CS2003 | 0.00 | CS2003 | 0.00 |
| CS2004 | 0.00 | CS2004 | 0.00 |
| CS2006 | 0.00 | CS2006 | 0.00 |
| CS2007 | 0.00 | CS2007 | 0.00 |
| CS2008 | 0.00 | CS2008 | 0.00 |
| CS2009 | 0.00 | CS2009 | 0.00 |
| CS2010 | 0.00 | CS2010 | 0.00 |
| CS2011 | 0.36 | CS2011 | 0.00 |
| CS2012 | 0.00 | CS2012 | 0.00 |
| CS2014 | 0.22 | CS2014 | 0.10 |
| CS2015 | 0.16 | CS2015 | 0.00 |
| CS2016 | 0.35 | CS2016 | 0.00 |
| CS2017 | 0.03 | CS2017 | 0.00 |
| CS2018 | 0.02 | CS2018 | 0.00 |
| CS2019 | 0.03 | CS2019 | 0.00 |
| CS2020 | 0.00 | CS2020 | 0.00 |
| CS2022 | 0.00 | CS2022 | 0.00 |
| CS2023 | 0.19 | CS2023 | 0.00 |
| CS2024 | 0.02 | CS2024 | 0.00 |
| CS3001 | 0.00 | CS3001 | 0.00 |
| CS3002 | 0.23 | CS3002 | 0.00 |
| CS3003 | 0.00 | CS3003 | 0.00 |
| CS3004 | 0.00 | CS3004 | 0.00 |
| CS3005 | 0.00 | CS3005 | 0.00 |
| CS3007 | 0.00 | CS3007 | 0.00 |
| CS3008 | 0.00 | CS3008 | 0.00 |

Appendix 2

| Percentage disc allocation by Consortia for Turing in July 2000 | | Percentage disc allocation by Consortia for Fermat in July 2000 | |
|---|-------------|---|-------------|
| Consortia | %Allocation | Consortia | %Allocation |
| CSE002 | 27.02 | CSE002 | 25.54 |
| CSE003 | 9.19 | CSE003 | 1.13 |
| CSE007 | 1.34 | CSE007 | 0.00 |
| CSE021 | 0.04 | CSE021 | 0.00 |
| CSE023 | 0.00 | CSE023 | 0.00 |
| CSE025 | 0.08 | CSE025 | 0.00 |
| CSE030 | 19.63 | CSE030 | 24.01 |
| CSE006 | 1.01 | CSE006 | 0.06 |
| CSE026 | 0.08 | CSE026 | 0.00 |
| CSE004 | 6.94 | CSE004 | 7.18 |
| CSE010 | 0.02 | CSE010 | 0.00 |
| CSE011 | 1.07 | CSE011 | 0.00 |
| CSE013 | 1.01 | CSE013 | 0.51 |
| CSE014 | 0.00 | CSE014 | 0.00 |
| CSE016 | 0.67 | CSE016 | 0.00 |
| CSE018 | 0.67 | CSE018 | 0.00 |
| CSE022 | 0.10 | CSE022 | 0.00 |
| CSE027 | 0.08 | CSE027 | 0.23 |
| CSE029 | 0.00 | CSE029 | 0.00 |
| CSE040 | 0.00 | CSE040 | 0.00 |
| CSE041 | 0.08 | CSE041 | 0.00 |
| CSE008 | 0.00 | CSE008 | 0.00 |
| CSE009 | 3.35 | CSE009 | 0.45 |
| CSE024 | 0.59 | CSE024 | 0.17 |
| CSE033 | 0.49 | CSE033 | 0.00 |
| CSE035 | 1.16 | CSE035 | 0.00 |
| CSE019 | 0.00 | CSE019 | 0.00 |
| CSE020 | 0.00 | CSE020 | 0.00 |
| CSE034 | 0.00 | CSE034 | 0.00 |
| CSE036 | 0.04 | CSE036 | 0.06 |
| HPCI Southampton | 0.00 | HPCI Southampton | 0.00 |
| HPCI Daresbury | 0.16 | HPCI Daresbury | 0.17 |
| HPCI Edinburgh | 0.16 | HPCI Edinburgh | 0.45 |
| CSN001 | 10.06 | CSN001 | 24.01 |
| CSN002 | 0.02 | CSN002 | 0.00 |
| BADC | 0.00 | BADC | 0.00 |
| CSN003 | 3.35 | CSN003 | 14.41 |
| CSN005 | 0.00 | CSN005 | 0.00 |
| CSN006 | 5.03 | CSN006 | 0.00 |
| CSN007 | 0.00 | CSN007 | 0.00 |
| CSN009 | 0.08 | CSN009 | 0.00 |
| CSN010 | 0.00 | CSN010 | 0.00 |
| CSN011 | 0.39 | CSN011 | 0.00 |
| CSN012 | 0.00 | CSN012 | 0.00 |
| CSN013 | 0.00 | CSN013 | 0.00 |
| CSN015 | 0.20 | CSN015 | 0.00 |
| CSN017 | 0.00 | CSN017 | 0.00 |
| CSB001 | 0.08 | CSB001 | 0.00 |
| CSB002 | 2.17 | CSB002 | 0.45 |
| CSB003 | 0.06 | CSB003 | 0.00 |
| CSP002 | 1.01 | CSP002 | 0.00 |
| CSP003 | 0.04 | CSP003 | 0.17 |
| CSS001 | 0.00 | CSS001 | 0.00 |
| CSS002 | 0.00 | CSS002 | 0.00 |
| CS2001 | 0.00 | CS2001 | 0.00 |
| CS2002 | 0.00 | CS2002 | 0.00 |
| CS2003 | 0.00 | CS2003 | 0.00 |
| CS2004 | 0.00 | CS2004 | 0.00 |
| CS2006 | 0.00 | CS2006 | 0.00 |
| CS2007 | 0.00 | CS2007 | 0.00 |
| CS2008 | 0.00 | CS2008 | 0.00 |
| CS2009 | 0.00 | CS2009 | 0.00 |
| CS2010 | 0.00 | CS2010 | 0.00 |
| CS2011 | 0.16 | CS2011 | 0.00 |
| CS2012 | 0.00 | CS2012 | 0.00 |
| CS2014 | 0.08 | CS2014 | 0.17 |
| CS2015 | 0.16 | CS2015 | 0.00 |
| CS2016 | 0.16 | CS2016 | 0.00 |
| CS2017 | 0.18 | CS2017 | 0.00 |
| CS2018 | 0.16 | CS2018 | 0.06 |
| CS2019 | 0.02 | CS2019 | 0.00 |
| CS2020 | 0.00 | CS2020 | 0.00 |
| CS2022 | 0.14 | CS2022 | 0.00 |
| CS2023 | 0.18 | CS2023 | 0.00 |
| CS2024 | 0.00 | CS2024 | 0.00 |
| CS3001 | 0.00 | CS3001 | 0.00 |
| CS3002 | 0.18 | CS3002 | 0.00 |
| CS3003 | 0.18 | CS3003 | 0.00 |
| CS3004 | 0.10 | CS3004 | 0.00 |
| CS3007 | 0.26 | CS3007 | 0.00 |
| CS3008 | 0.49 | CS3008 | 0.45 |
| CS3005 | 0.06 | CS3005 | 0.00 |

Percentage usage of HSM by Consortium for July 2000

| Consortium | % Usage |
|------------|---------|
| CSE002 | 0.80 |
| CSE003 | 0.08 |
| CSE030 | 0.20 |
| CSE004 | 2.77 |
| CSE013 | 0.12 |
| CSE041 | 0.08 |
| CSE024 | 2.81 |
| CSE035 | 0.00 |
| CSN001 | 12.58 |
| BADC | 10.75 |
| CSN003 | 66.82 |

Appendix 3

| Percentage PE usage on Turing by Research Council for July 2000 | | | Percentage CPU usage on Fermat by Research Council for July 2000 | | |
|---|---------|--|--|---------|--|
| Research Council | % Usage | | Research Council | % Usage | |
| EPSRC | 76.69 | | EPSRC | 17.98 | |
| HPCI | 0.37 | | HPCI | 0.00 | |
| NERC | 19.91 | | NERC | 76.27 | |
| BBSRC | 2.69 | | BBSRC | 0.00 | |
| ESRC | 0.00 | | ESRC | 0.00 | |
| PPARC | 0.12 | | PPARC | 0.08 | |

| Percentage Disc allocated on Turing by Research Council for July 2000 | | | Percentage Disc allocated on Fermat by Research Council for July 2000 | | |
|---|-------------|--|---|-------------|--|
| Research Council | % Allocated | | Research Council | % Allocated | |
| EPSRC | 76.13 | | EPSRC | 62.10 | |
| HPCI | 0.34 | | HPCI | 0.64 | |
| NERC | 19.11 | | NERC | 39.78 | |
| BBSRC | 3.16 | | BBSRC | 0.53 | |
| ESRC | 0.06 | | ESRC | 0.00 | |
| PPARC | 1.18 | | PPARC | 0.18 | |

| Percentage HSM usage by Research Council for July 2000 | | |
|--|---------|--|
| Research Council | % usage | |
| EPSRC | 6.87 | |
| HPCI | 0 | |
| NERC | 92.91 | |
| BBSRC | 0 | |
| ESRC | 0 | |
| PPARC | 0 | |

Appendix 4

The following tables show the training and support resource usage by the consortias in person days to the current month.

Training Used to end of July

| Project | Used |
|-----------------------------------|-------------|
| cse009 GR/M07441 Catlow | 0 |
| csn001 SOC Core Strategic Webb | 0 |
| cse017 GR/L58699 Luo | 0 |
| cse024 GR/M44453 Tennyson | 0 |
| cse002 gr/m01753 Gillan | 0 |
| cse007 gr/m05348 Foulkes | 2 |
| cse003 gr/m01784 Taylor | 6 |
| cse004 UK Turbulence Sandham | 2 |
| cs2001 CompApps3D Jain | 0 |
| csb003 117/SO9645 Williams | 0 |
| cse011 GR/K52317 Williams | 0 |
| cse010 GR/L04108 Williams | 0 |
| cse013 Complex Flows Leschziner | 3 |
| cse021 Magnetism Staunton | 1 |
| cse025 Nuclear Theory Bishop | 1.5 |
| csn003 UGAMP O'Neill | 4 |
| csn005 Earth Mantle Davies | 6 |
| csn017 Antarctic Ice Payne | 2 |
| cse030 GR/M56234 Cates | 7 |
| csp002 Plasmas Chapman | 4 |
| csp003 Pulsars Lyne | 2 |
| css002 Panel Surveys Crouchley | 2 |
| cs2002 PTMP Lyne | 0 |
| cs3001 - Staveley | 3 |
| cs3002 DNA Novik | 2 |
| cs3004 Virtual Envs Avis | 1 |
| cs3005 Queing Zarei | 3 |
| cs3006 Room Acoustics Li | 1 |
| cs2005 ISAAG Walsh | 0 |
| cs2007 SNOW Choularton | 1 |
| cs2012 Large Eddys Qin | 1.5 |
| cs2014 Unstable Flames Karlin | 2 |
| cs2015 Aerodynamics Tejera-Cuesta | 1.5 |
| csb001 27/B07117 Goodfellow | 2 |
| ukhec Jaffri | 2 |

Support Used to end of July

| Project | Used |
|--|--------------|
| cse009 GR/M07441 Catlow | 0 |
| cse006 gr/m05201 Briddon | 0 |
| cse002 gr/m01753 Gillan | 132 |
| cse011 GR/K52317 Williams | 2.18 |
| csn001 SOC Core Strategic Webb | 2 |
| cse007 gr/m05348 Foulkes | 1 |
| cse017 GR/L58699 Luo | 0 |
| cse008 GR/M07624 Hillier | 0 |
| cse024 GR/M44453 Tennyson | 0 |
| cse021 GR/L95427 Staunton | 0 |
| cse010 GR/L04108 Williams | 15.95 |
| cse030 GR/M56234 Cates | 25 |
| cs2002 PTMP Lyne | 0.25 |
| cs2008 ET Minerals Genge | 7.91 |
| csn005 GR9/2909 Davies | 27 |
| cs2005 ISAAG Walsh | 0 |
| cse003 gr/m01784 Taylor | 3 |
| csp003 Pulsars Lyne | 1 |
| csb001 Macro Molec Interact Goodfellow | 2 |

Appendix 5

| Code | PI | Subject | Subject Area |
|--------|------------------------------------|------------------------------------|------------------------|
| Cse002 | Dr Nicolas Harrison (Gillan) | Support for the UKCP | Physics |
| Cse003 | Prof. Ken Taylor | HPC Consortiums 98- 2000 | Physics |
| Cse004 | Dr Neil Sandham | UK Turbulence | Engineering |
| Cse006 | Dr Patrick Briddon | Covalently Bonded Materials | Materials |
| Cse007 | Dr Matthew Foulkes | Quantum Many Body Theory | Physics |
| Cse008 | Dr Mark Vincent (Hillier) | Model Chemical Reactivity | Chemistry |
| Cse009 | Dr Ben Slater (Catlow) | HPC in Materials Chemistry | Chemistry |
| Cse010 | Dr John Williams | Free Surface Flows | Engineering |
| Cse011 | Dr John Williams | Open Channel Flood Plains | Engineering |
| Cse013 | Dr David Aspley (Leschziner) | Complex Engineering Flows | Engineering |
| Cse014 | Dr Cassiano de Oliverira (Goddard) | Probs in Nuclear Safety | Engineering |
| Cse016 | Dr Stewart Cant | Turbulent Combustion | Engineering |
| Cse018 | Dr Stewart Cant | Turbulent Flames | Engineering |
| Cse019 | Dr Jason Lander (Berzins) | ROPA | Information Technology |
| Cse020 | Dr Marek Szularz | Symmetric Eigenproblem | Information Technology |
| Cse021 | Dr Julie Staunton | Magentisim | Physics |
| Cse022 | Mr Niall Branley (Jones) | Turbulent Flames | Engineering |
| Cse023 | Allen | Liquid Crystalline Materials | Robin Pinning |
| Cse024 | Dr Robert Allan (Tennyson) | ChemReact 98-2000 | Chemistry |
| Cse025 | Dr Niels Rene Walet (Bishop) | Nuclear Theory Progamme | Physics |
| Cse026 | Dr Maureen Neal | J90 move | |
| Cse027 | Dr M Imregun | J90 move | |
| Cse028 | Prof. P.W. Bearman | J90 move | |
| Cse029 | Dr David Aspley (Leschziner) | J90 move | Engineering |
| Cse030 | Prof M Cates | HPC for Complex Fluids | Physics |
| Cse031 | Brebbia | J90 move | |
| Cse033 | Dr M Imregun | Tubomachinery core compressor | Chemistry |
| Cse034 | Dr Paul Durham | R&D of liner/non-linear systems | Mathematics |
| Csn001 | Mrs Beverly de Cuevas (Webb) | HPCI Global Ocean Consortium | |
| Csn002 | Dr Mark Vincent (Hillier) | Pollutant Sorption on Mineral Surf | |
| Csn003 | Dr Lois Steenman-Clark (O'Neill) | UGAMP | |
| Csn005 | Dr Huw Davies | Constraining Earth Mantle | |
| Csn006 | Dr John Brodholt (Price) | Density Functional Methods | |
| Csn007 | Dr John Brodholt (Price) | Density Functional Methods | |
| Csn008 | Hulton | Sub-Glacial Process | |
| Csn009 | Dr Roger Proctor | | |
| Csn010 | Dr Jason Lander (Mobbs) | Flow over Complex terrain | |
| Csn011 | Dr Ed Dicks (Thorpe) | J90 move | |
| Csb001 | Dr David Houldershaw (Goodfellow) | Macromolecular Interactions | |
| Csb002 | Dr Adrian Mulholland (Danson) | Stability of Enzymes at high temp | |
| Csb003 | Dr John Carling (Williams) | J90 move | |
| Css001 | Dr Stan Openhaw | Human Systems Modelling | |
| Css002 | Dr Robert Crouchley | Dropout in panel surveys | |
| Hpcid | Dr Robert Allan | | |
| Hpcie | Dr David Henty | | |
| Hpcis | Dr Denis Nicole | | |
| Cs2001 | Dr Sudhir Jain | 3D Ising Spin Glass | |
| Cs2002 | Dr Ingrid Stairs (Lyne) | Millisecond Pulsars | |
| Cs2003 | Mr Tom Coulthard | Holocene Sediment Fluxes | |
| Cs2004 | Dr A. Paul Watkins | Internal Combustion Engine | |
| Cs2005 | Mr Sean Walsh | Arabidopsis Genome | |
| Cs2006 | Prof. Walter Temmerman | Superconductivity & Magmetisim | |
| Cs2007 | Choularton | Precipitation in the Mountains | |
| Cs2008 | Dr Matthew Genge | Extraterrestrial Mineral Surfaces | |
| Cs3001 | Mr John Andrew Staveley | Helical Coherent Structures | |