HOKUSAI Users Meeting in Jul. 2017

ACCC
Information System Division
31 Jul. 2017

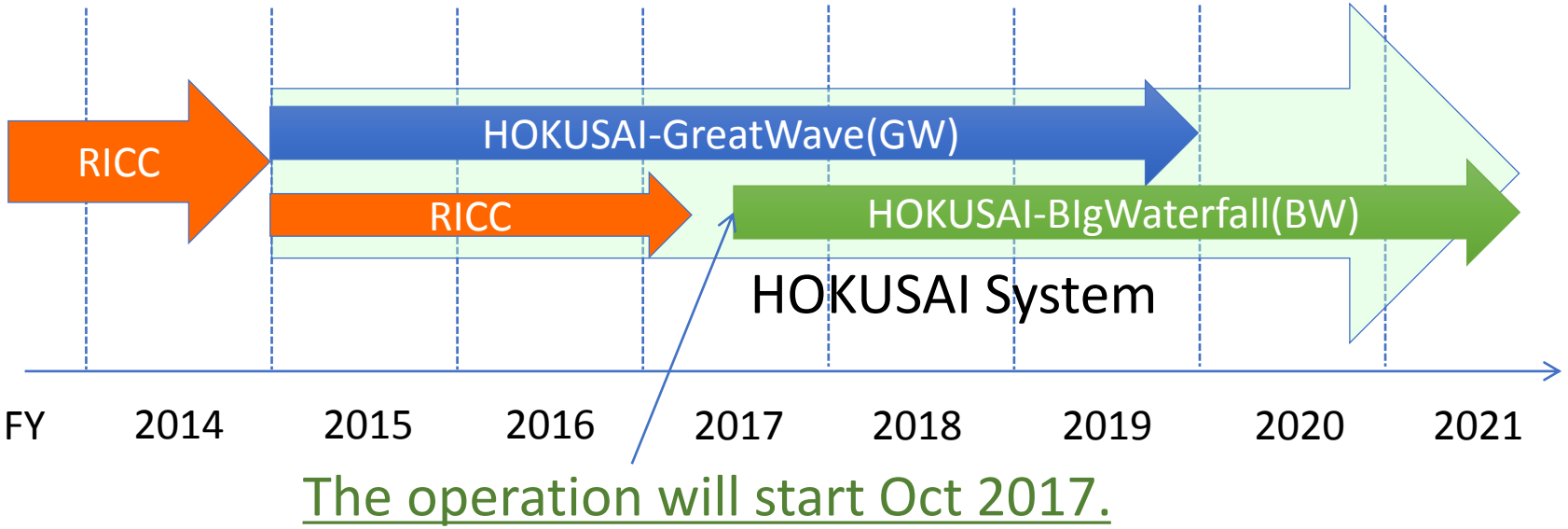
Outline

- Operation schedule of HOKUSAI
  - Specification of HOKUSAI BigWaterfall system
  - Regular operation of BW will start around 10/12.
  - 1 week system maintenance around the beginning of Sep
- Application of the 2nd project review of FY2017
  - For GreatWave, only GW-ACSL can be acceptable about 40%.
  - For BigWaterfall, application is acceptable with the upper limit of 10% .
- Changes after starting regular operation of BW
  - Directory structure of the filesystem
  - Login node and Portal site

Operation schedule of HOKUSAI

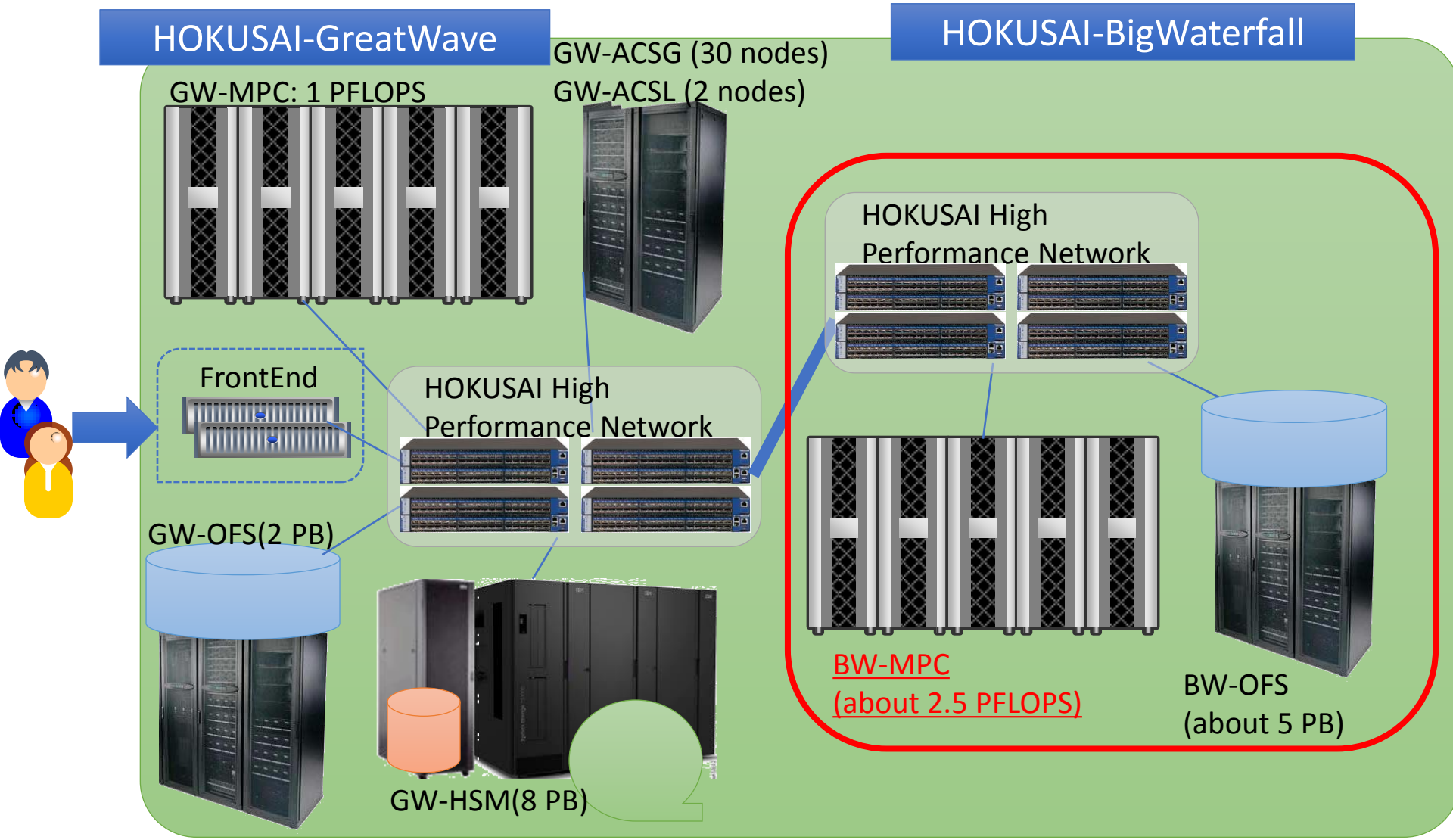
Operation concept of HOKUSAI system

- We have operated HOKUSAI GreatWave (GW) system since 1st Apr 2015.
- HOKUSAI BigWaterfall (BW) system will be launched Oct 2017.
  - HOKUSAI GW and BW systems share the same storage system.
  - HOKUSAI BW system is Intel Architecture (IA) compatible.



The operation will start Oct 2017.

Computing Resources in FY 2017 (Oct to Mar)

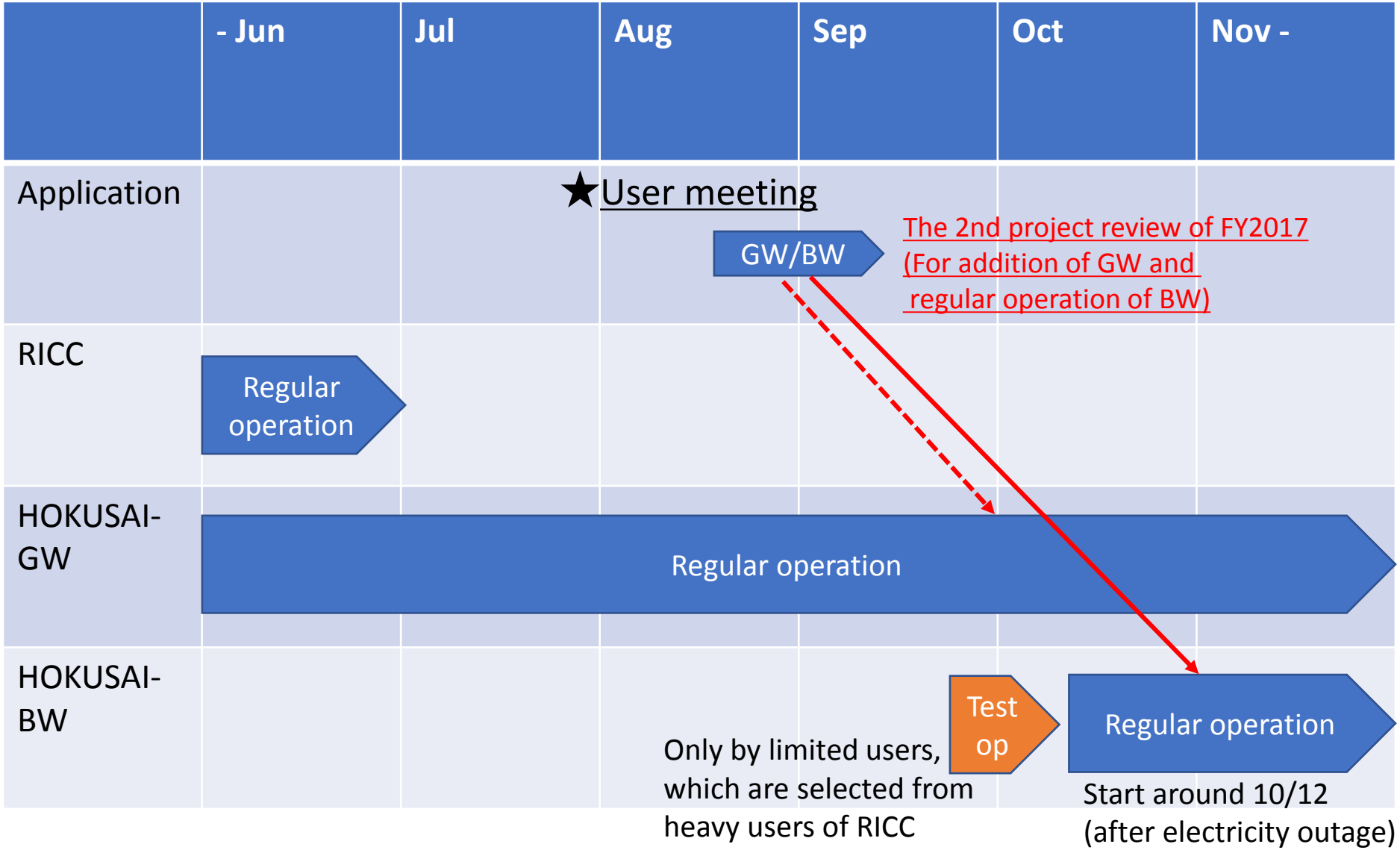


Specifications of HOKUSAI BigWaterfall system

- Massively parallel supercomputer (BW-MPC)
  - 840 nodes, 33,600 cores
  - Peak performance (64bit floating point): 2.58 PFLOPS
  - CPU: Intel Xeon Gold 6148(2.4 GHz, 2 CPUs/node, 40 cores/node)
  - Memory: DDR4-2666 96GB/node
    - Memory BW: 255 GB/s
  - Interconnect: InfiniBand EDR (12.6 GB/s)
- Update GW-ACSL
  - 2 nodes
  - CPU: Intel Xeon E7-4880v2 (4 CPUs/node, 60 cores/node)
  - Memory: DDR3-16000 1 TB/node -> 1.5 TB/node
- Storage system
  - Online(Disk) storage: 5 PB

GW-MPC has higher band width and network performance.
-> highly parallel jobs
BW-MPC has higher computational performance and memory size.
-> small to middle scale jobs

Startup schedule of HOKUSAI BigWaterfall system (Jun 2017 – Oct 2017)



System maintenance

- Maintenance for combining GW and BW system
  - Provisional schedule: from 8/31 to 9/7
    - HOKUSAI including GW system is not available.
  - All jobs in the queue will be deleted in the maintenance.
    - The server of job control system is changed from GW to BW.
      - The way to use the job control system is the same.
  - ACSG and ACSL system will upgrade to Red Hat Enterprise Linux (RHEL) 7.3.
    - Gaussian will upgrade to Gaussian 16.
      - Gaussian09 is also available but unsupported officially.
    - ANSYS will upgrade to ANSYS 18.

- Maintenance with electricity outage
  - Provisional schedule: from 10/6 to 10/11
  - Regular operation of BW will start after this maintenance.

Application of the 2nd project review of FY2017

Summary of Application of the 1st project review of FY2017

- 38 projects for General Use
  - 2 projects are large-scale.
  - After review process, all projects were adopted.
- Total applied core time and permitted core time for each subsystem (percentage of annual core time)
  - GW-MPC: 151.1%→133.3%
    - 8 projects that have lower review evaluations were reduced computation time by half.
  - GW-ACSG: 142.5%
  - GW-ACSL: 87.9%

GW-MPC and ACSG are permitted more than 130%.
GW-ACSL has room for acceptable of 40%.

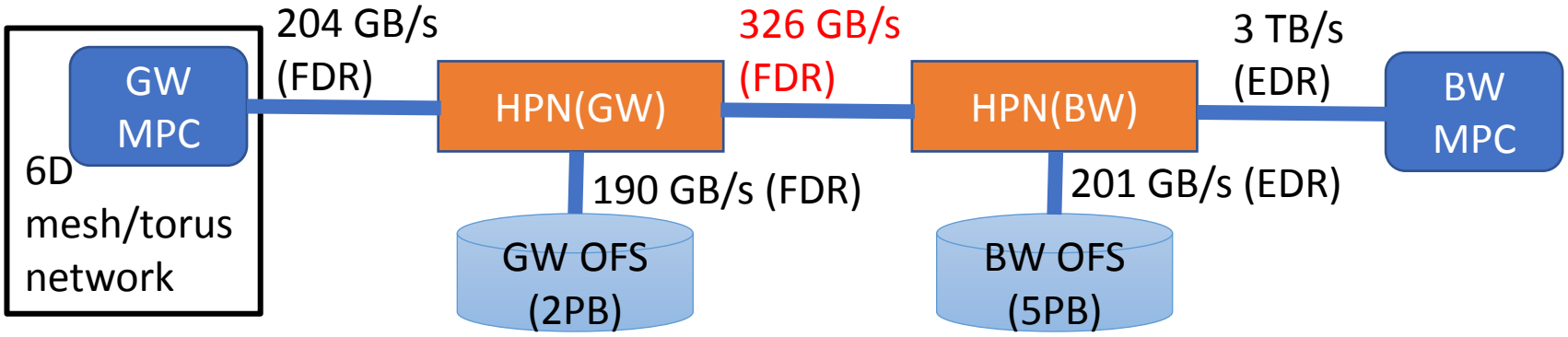
Application of the 2nd project review of FY2017

- Application for additional project of GreatWave system
  - GW-ACSL can be acceptable about 40%.
  - GW-MPC and ACSG are not recruited.
    - GW-MPC and ACSG are already full because already permitted more than 130% at the 1st project review of FY2017.
    - BW system is available.
- Application for regular operation of BigWaterfall system
  - We will begin regular operation early without trial operation.
    - Most users are familiar with Intel Xeon architecture.
    - If operation of trial use is 2 months, the remaining period is only 4 months.
    - This FY operation also includes aspect of trial use.
    - Review process is carried out assuming that the estimation of the computation time is approximate.
  - The upper limit of computation time is 10% of BW-MPC for 6 months.
    - Large-scale applications are not accepted.
      - Tuning of the new system including AVX-512 would not be performed enough.
      - Compared to GW-MPC, BW-MPC is suitable for small to middle scale jobs.
    - If a General Use project run out of core time and applies additional core time, ACCC review the relevance and can add core time of less than 5%.

Changes after starting regular operation of BW

Online Storage

- Online Storage (OFS)
  - The capacity of GW OFS is 2PB and BW OFS is 5PB.
  - Each OFS is accessible from both GW and BW.
  - There is enough bandwidth between GW and BW.
  - Both GW and BW OFS have /home and /data regions.
- Schedule of Online Storage
  - GW OFS will be removed in 2020.
  - BW OFS will be operated for 5 years.



/home region and /data region

- /home region
  - In GW OFS, all user are allocated 4TB.
    - In BW OFS, all user will also be allocated 4TB.
  - At the time of the starting the regular operation of BW
    - Login directory is change from /home in GW OFS to /home in BW OFS.
    - Only dot file necessary for login is copied by the administrator.
    - /home in GW OFS changes the name to /gwhome.
  - After the starting the regular operation of BW, new user is allocated 4 TB only in BW OFS basically.
- /data region
  - In GW OFS, an applied project is allocated the applied size.
    - In BW OFS, all project allocated in /data in GW OFS will also be allocated the same size in GW OFS.
  - At the time of the starting the regular operation of BW
    - Any file is not copied by the administrator.
    - /data in GW OFS changes the name to /gwdata.
  - After the starting the regular operation of BW, new application for /data region is allocated the region only in BW OFS basically.

Login node and portal site of HOKUSAI

- Login node
  - After starting regular operation of BW, login node of HOKUSAI is changed from “greatwave.riken.jp” to “hokusai.riken.jp”.
  - Login node of GW, “greatwave.riken.jp”, is used for other purposes.
    - Accessible only from “hokusai.riken.jp”
    - For IMSL, old version of ISV, high load processing, and test by SE.
- Portal site
  - After starting regular operation of BW, hostname “hokusai.riken.jp” is the same.
    - The server of portal site is changed from GW to BW.

Provisional schedule

- 8/8 Starting date for Application of the 2nd project review of FY2017
- 8/29 Closing date for Application of the 2nd project review of FY2017

- 8/31-9/7 Maintenance for combining GW and BW system
- 9/28 Announce of review results of Application of the 2nd project review of FY2017
- 10/6-11 Maintenance with electricity outage

- 10/12 Regular Operation of BigWaterfall will start.
  - Additional project of GreatWave will also start.