

DATABASE SYSTEM DEVELOPMENT FOR OPERATIONAL PARAMETER OF RSG-GAS BASED ON WEB

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ABSTRACT

DATABASE SYSTEM DEVELOPMENT FOR OPERATION PARAMETER OF RSG-GAS BASED ON WEB. The Information and data collection for parameter operation are important well documented for the aging management of research reactor RSG-GAS. The RSG-GAS multipurpose reactor has been operating for almost 30 years so it is necessary to be evaluated on using the database system for the management operation of RSG-GAS especially ways of working the structure, system, and components (SSC). The system database SSC of RSG-GAS still static. It is not easy to find the necessary data. The system database based on WEB are expected to be used in an online system to obtain information on operation parameter of each component of the system. The purpose of this study is to create and develop RSG-GAS database system for parameter operation by utilizing web-based technologies. The system database are expected contain the data and information of parameter operation which can be integrated with some certain user and administration to obtain the information of operation processing RSG-GAS. By using this system database can be monitor, that the operation still within the operating limit. The system database has made for The operation recording of some components. The graph of operation has made for some component. The database system based on WEB has built using bootstrap framework technology, PHPMySQL.

Keyword: Database System, RSG-GAS, Operation parameter, WEB, PHPMySQL

ABSTRAK

PENGEMBANGAN SISTEM DATABASE UNTUK PARAMETER OPERASI RSG-GAS BERBASIS WEB. Informasi dan pengumpulan data untuk operasi parameter penting didokumentasikan dengan baik untuk pengelolaan penuaan reaktor riset RSG-GAS. Reaktor serbaguna RSG-GAS telah beroperasi selama hampir 30 tahun sehingga perlu dievaluasi penggunaan sistem basis data untuk pengelolaan operasi RSG-GAS terutama cara kerja struktur, sistem dan komponen (SSC). Sistem database SSC RSG-GAS masih statis. Tidak mudah menemukan data yang diperlukan. Sistem database berbasis WEB diharapkan dapat digunakan dalam sistem online untuk mendapatkan informasi mengenai parameter operasi masing-masing komponen sistem. Tujuan dari penelitian ini adalah untuk membuat dan mengembangkan sistem database RSG-GAS untuk operasi parameter dengan memanfaatkan teknologi berbasis web. Sistem basis data berisi data dan informasi operasi parameter yang dapat diintegrasikan dengan beberapa pengguna dan administrasi tertentu untuk mendapatkan informasi proses operasi RSG-GAS. Dengan menggunakan database sistem ini bisa dipantau, agar operasi masih berada dalam batas operasi. Database sistem telah dibuat untuk perekaman operasi beberapa komponen. Grafik operasi telah dibuat untuk beberapa komponen. Sistem database berbasis WEB telah dibangun menggunakan teknologi framework bootstrap, PHPMySQL.

Kata kunci: Sistem Basis Data, RSG-GAS, Parameter Operasi, WEB, PHPMySQL

INTRODUCTION

In relation to the RSG-GAS management activities is essential the data collection for parameter operation that is well-documented. Until now, the RSG-GAS has been operating almost 30 years so it is necessary to study the management operation of RSG-GAS especially for structure, system, and components (SSC). The history of operation parameter each SSC can be accessed by interested parties online. With database system based on WEB expected can facilitate the acquisition and tracking of data and information quickly and easily. Besides that, the entry data of parameter operation RSG-GAS can be done online.

During around the years 1999 until 2016, RSG-GAS make a report of operation reactor. RSG-GAS had a database system still static and use Microsoft Access for making a report of toperation reactor. Therefore the team RSG-GAS has updating and revised Document RSG-GAS, "Safety Analysis Report (SAR) RSG-GAS". After then, the database system has development for component reliability especially repairing and maintenance for RSG-GAS based on WEB [1]. IAEA, for long term operation (LTO) has fostering information exchange and establishing databases and provision of SALTO (Safety Aspects of Long Term Operation) which includes the establishment of IAEA Safety Standards and other LTO related documents [2]. A system degradation modeling is proposed for the reliability assessment of digital Instrumentation and Control (I&C) systems in Nuclear Power Plants (NPPs) [3]. Korea has classified the safety of structures, systems, and components (SSCs) for pool reactor based on the IAEA methodology [4]. Beside that, in the system database, modeling with description logic made for the entity-relationship modeling [5]. The relationship modeling with dynamics types has made for subset of entity type instances and across entity [6]. Analysis empirical has done for programming based on Graphic User Interface (GUI) [7]. The life cycle management has been development to find relating of critical structural components in Indian thermal, fast reactors and reprocessing facilities [8]

Data collection system of operating parameters in the process of RSG-GAS is still stored in database static so it is not easy to find necessary the data and information. The data and information not yet integrated with the user. Besides that, the information must more easier to be displayed within operational limits for specific system and components. This are needed in the form of charts related to the value of the minimum limit operation and maximum so it is still within the operating limit.

The aim of this study create and develop RSG-GAS database system for operation parameter some system and component by utilizing web-based technologies. The database system is expected can be integrated with some certain user and administration to obtain the information of operation processing RSG-GAS. Beside that, the charts of operation parameter for specific system and components related to the value of the minimum limit operation and maximum must are within the limits for operation.

The activity is preparing data and information of some system processing and component of the reactor. After then, develops the database system of operation of the multipurpose reactor by utilizing Web-based technology. The application recording a component code, the component name, time spent in the component code. Within the scope of the recording operational of components can make a recording of the list of components, therefore can see how the use of the components on a daily basis in the form graphs. This website is built using PHPMySQL .

METHODOLOGY

The design of the system database RSG-GAS is creating tables of data and information of parameter operation RSG-GAS with Entity Relationship Diagram (ERD). ERD is a modeling technique for the relational database. This is a graphical representation of an information system that shows the relationship between people, objects, places, concepts or events in the system [7]. The design stage is make a structure, database design, and the design view website RSG-GAS. The data and information are from an operating report for each core of RSG-GAS. The study includes establishment a database system open source XAMPP Structure Query Language (SQL) with MYPHPADMIN [1]. The operation parameter and operation total of each core were collected from previous year until now. The data were entry by interactive. XAMPP is free software which has function a stand-alone server (localhost). This software consists of the Apache HTTP Server, MySQL database, and the translator's written in PHP. XAMPP software is an acronym for X (four any operating system) Apache, MySQL, PHP, and Perl. The program is available under the HTML and Guide

Interfaces Graphic (GUI) [7, 9]. This program is easy to use Web server that can serve dynamic Web page display [10, 11, 14, 15].

At this stage, the creation of applications is helping a user in the data managing a component usage in operation and reporting in the form of graphics. This application can be accessed through the website. In this stage, the study begins with the navigation structure, workflow diagrams, and system views. Implementasi this stage using XAMPP and Bootstrap Framework [12, 13, 16].

The follow diagrams describe the activities of the application (Fig. 1). The main menu defined by home page. The next step is to enter the data activity operation and the data corresponding components by admin. An admin or the certain user can enter, modify and delete operational of the component. The output is parameter operation such as lower and upper limit operation and graphic.

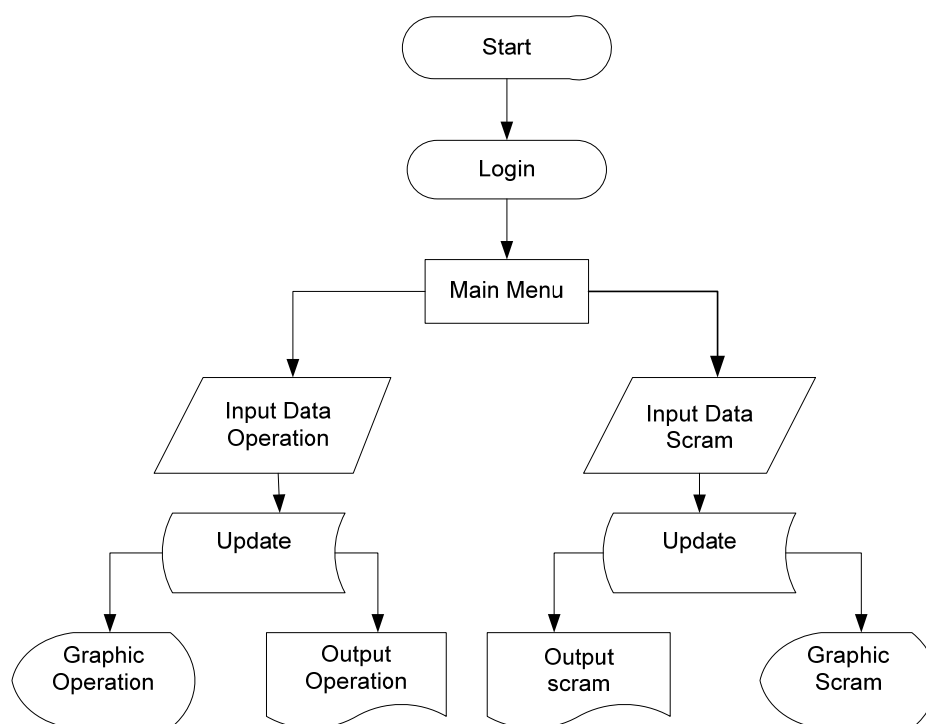


Figure 1. Navigation Structure

RESULTS AND DISCUSSION

The design of ERD is consist of data and information table. The table of data includes data operation, data scram, table of system, table of component, table of core and the person whose operation and responsible. Those tables consist of code and description, NIP and name of person. The information is include graphic operation, graphic scram, operation and scram. Design navigation structure is implemented in websites. The design of ERD of operation and scram RSG-GAS shown in Figure 2.

The stage implementation is required phpMyAdmin as a web-based tool. The database created used DML (Data Manipulation Language) and DDL (Data Definition Language). PhpMyAdmin in the module Apache and MySQL on XAMPP, users can create a new database, the new table, and all activities database settings. The users can also export and import a file extension that contains the script SQL query. This allows the user to move a database from one computer to another. In old database system RSG-GAS with Microsoft Access only for single user. The users can not export and import a file SQL. This can helped to back up data which has entried. The some software Microsot Access is not open source. This can not easy to get this software application.

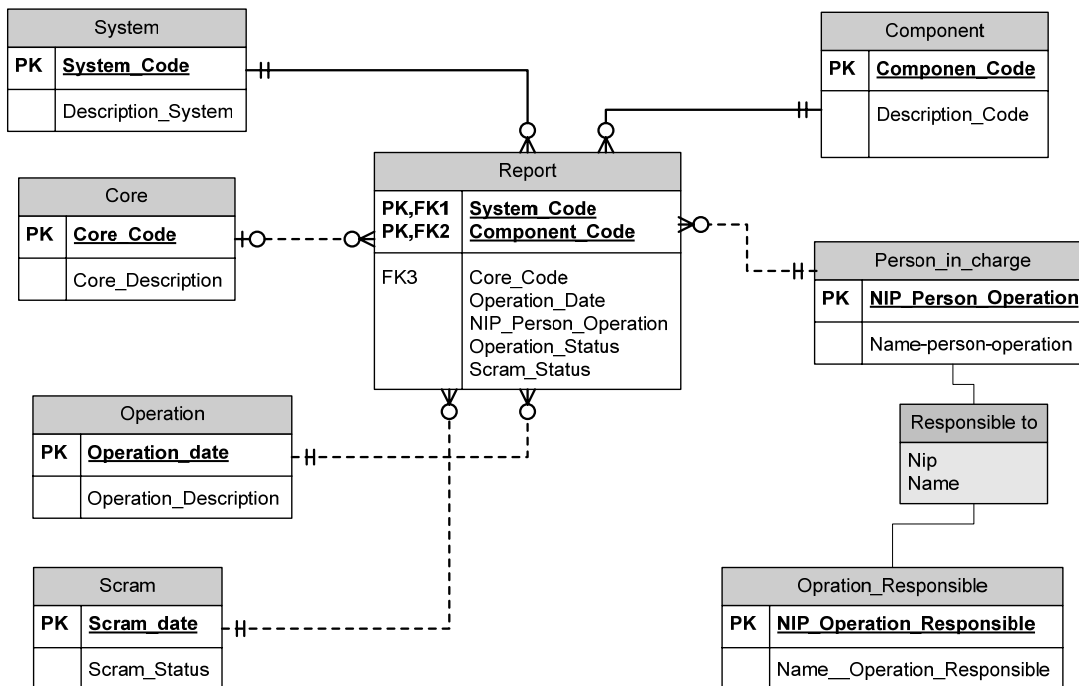


Figure 2. Design ERD of operation and scram RSG-GAS

The first step, the application is make sure the module Apache and MySQL on XAMPP in an active state (Fig. 3).

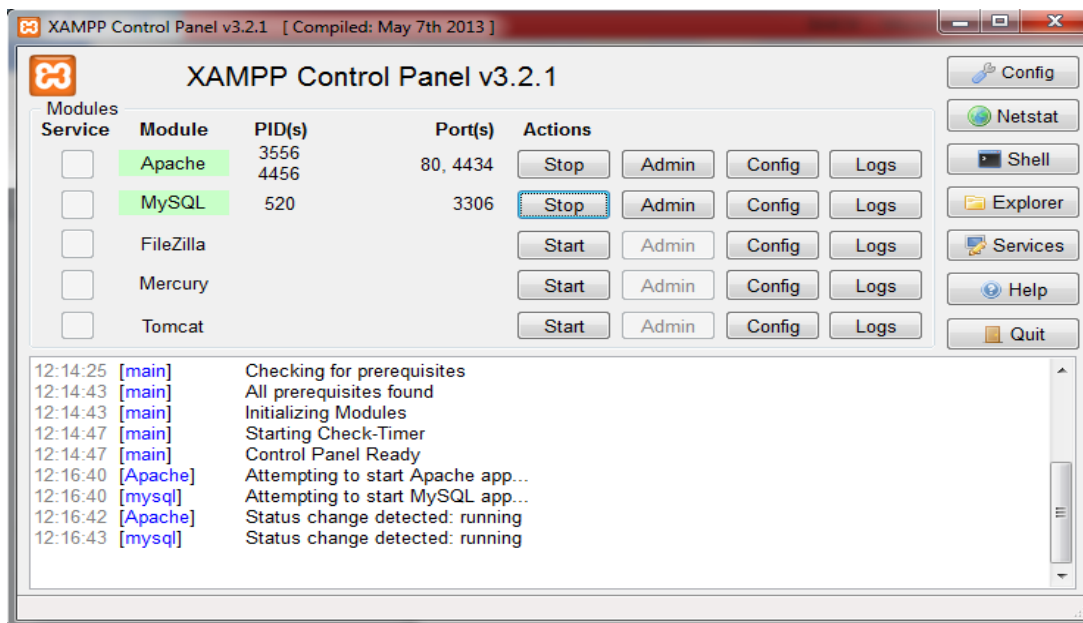


Figure 3. XAMPP Control Panel

After MySQL and Apache module is active, go to phpMyAdmin in a browser by typing the URL address `Http://localhost/PHPMyAdmin` (Fig. 4). In the old database system RSG-GAS with Microsoft Access is not based WEB, so to entry database can not online from the other computer and in some certain time. The data not keep on server. After the initial page of phpMyAdmin open, the database creation begins. The first step is to create a database with the name. In the database, there are three tables, admin data, operation data and scram data that each has its column of its own.

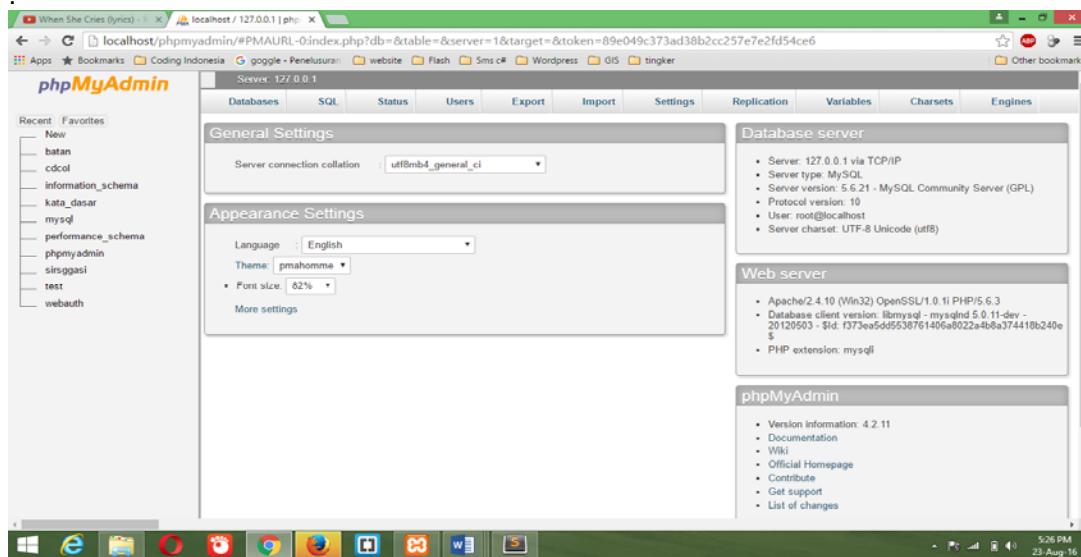


Figure 4. Display PHPMYAdmin

The index page is the first page that appears when a website is accessed system operation and components operation. First opened in a web browser and localhost address name. A certain computer connected to the internet so that it can access the page. While in the old database system, a certain computer not connected to the internet so another certain user and admin can not access the application database system RSG-GAS together. This page will only display the login page. The login page is a page that is used to get into the admin home page so that it can have access to perform the process on the operation of the component. To enter the login page, there are two forms of input and administrators were asked to fill in the username and password previously been input in the database.

Dashboard or homepage is the first page when login successfully accesses the operating of system and components. This page provides instructions on entering data on the using this system so that it can easily conduct data processing and display process data. Nothing like on the old database system with Microsoft Access, it is not easy to display process data. Dashboard display is shown in Fig. 5 [13].



Figure 5. Dashboard Page Views

Operating data page is a page that is used to display data based on the database in operation system. In this table, the admin can modify and delete data that has been entered into the database. While in the old database system, to modify and delete data are not interactive direct such as in new application database system. In the form of operation, are consist of core number, component code, component name, operation date, energy for operation, energi minimal and energi maximal. The operating data table is shown in Fig. 6 [13].

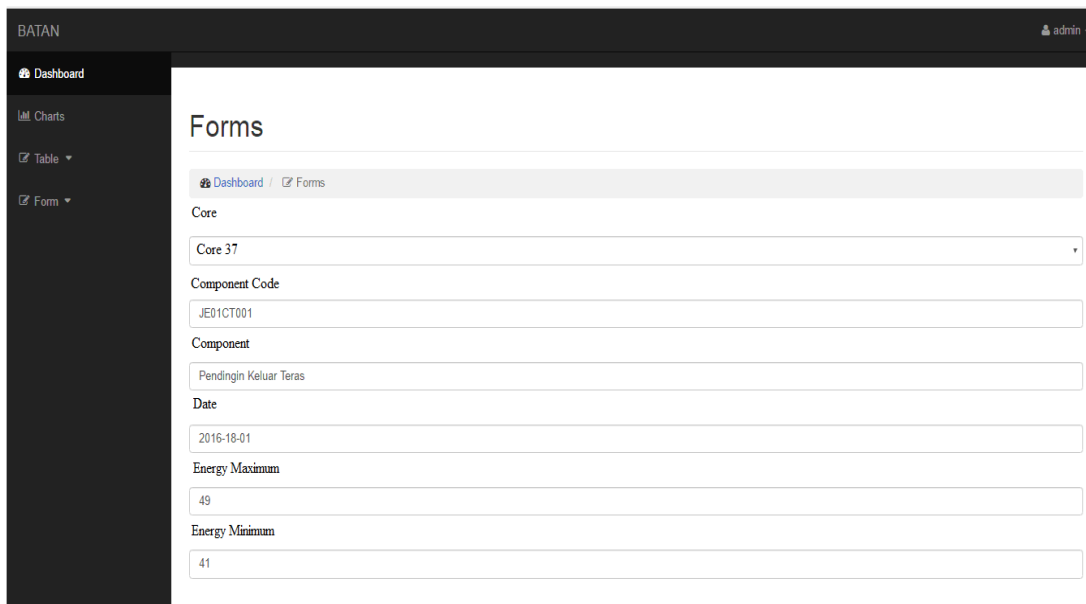


Figure 6. Operating Data Form

The graph (Chart) is used admin to see the data of component operation that has been entered into the database by admin. In the old database system has not been able to display graphics of operational data. The operating graph is shown in Fig. 7. In the operational data graph consist menu for Chart, Form, Table and Dashboard. This data are the data operational in energy (MWD) [13].

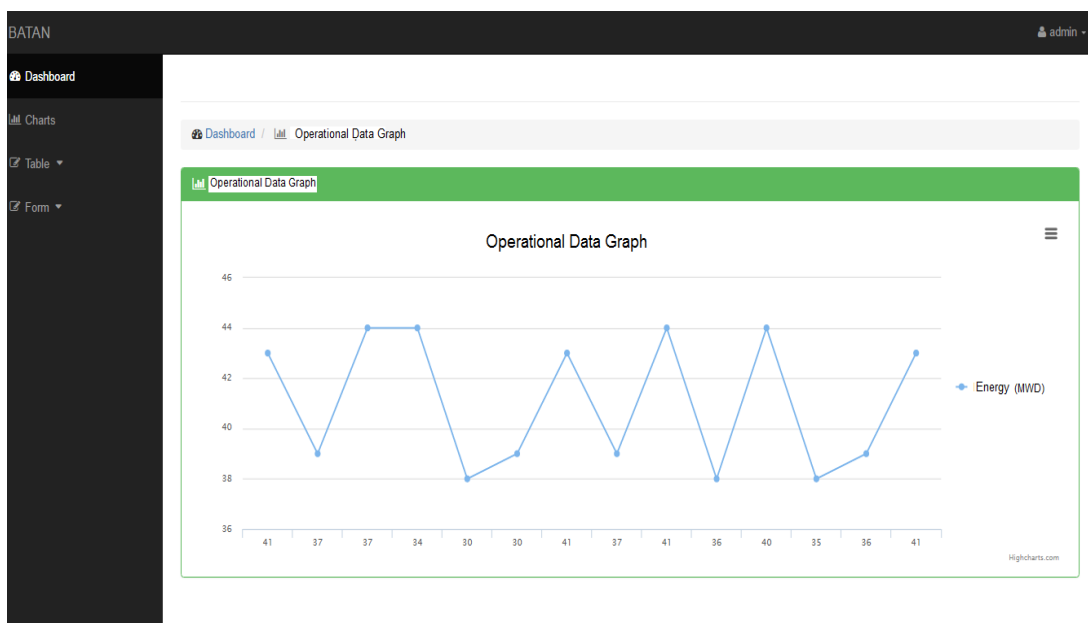


Figure 7. Chart of Operation Information

Scram data is used to determine the cause of the failure component. The admin can be entered into the database. The form of scram data shown in Fig. 8. Scram data form is a page that is used to enter data components - components on the data scram in RSG-GAS based on the energy (MWD) used every terrace to determine the cause of the damage of the component. On page form data scram, admins can enter data that must be entered into the database. In the old database system has not been able to interactive to enter operation data [13].

Figure 8. Scram Data Form

In the scram tables on this page, the admin can view, modify and delete data that has been entered into the database. In the old database system, the admin modify or delete is not interactive. Scram table is shown in Fig 9. The distribution of data consists the data operational in Energy (MWD). The column consist core number, start date, start time, finish date, finish time, duration, energy (MWD), energy cumulative(MWD), update and delete [13].

Username	Core	Start Date	Start Time	Finish Date	Finish Time	Duration Time	Energy	MWD	€ MWD	Update	Delete
admin	Teras 39	2016-18-01	14:15	2016-18-01	15:01	0.33	0.1	0	0	Update	Delete
admin	Teras 39	2016-18-01	15:01	2016-18-01	15:16	0.25	5	0.0521	0.0521	Update	Delete
admin	Teras 39	2016-18-01	15:16	2016-18-01	15:31	0.252	10	0.1042	0.1563	Update	Delete
admin	Teras 39	2016-18-01	15:31	2016-18-01	24:00	8.48	15	5.3021	5.4584	Update	Delete
admin	Teras 39	2016-30-08	12:00	2016-30-08	12:15	0.15	10	15	20.4584	Update	Delete
admin	Teras 39	2016-20-01	24:00	2016-20-01	00:00	24	15	15	35.4584	Update	Delete
admin	Teras 39	2016-21-01	24:00	2016-21-01	00:00	24	15	15	50.4584	Update	Delete
admin	Teras 39	2016-22-01	24:00	2016-22-01	00:00	24	15	15	65.4584	Update	Delete
admin	Teras 40	2016-23-04	23:45	2016-23-04	24:00	0.25	4.454	0.05	0.05	Update	Delete
admin	Teras 40	2016-24-04	00:00	2016-24-04	08:04	8.04	4.454	1.5	1.59	Update	Delete

Figure 9. Scram Table

The output of data operation each core can print or save in excel file or pdf file as well as the output of data scam. While in the old database system, the output of data operation has not been able to print in pdf file. The output consist username, code of component, component name, start date, finish date, time total, energy (MWD), energy cumulative (MWD), and information. The output of data operation shown in Fig 10 [13].

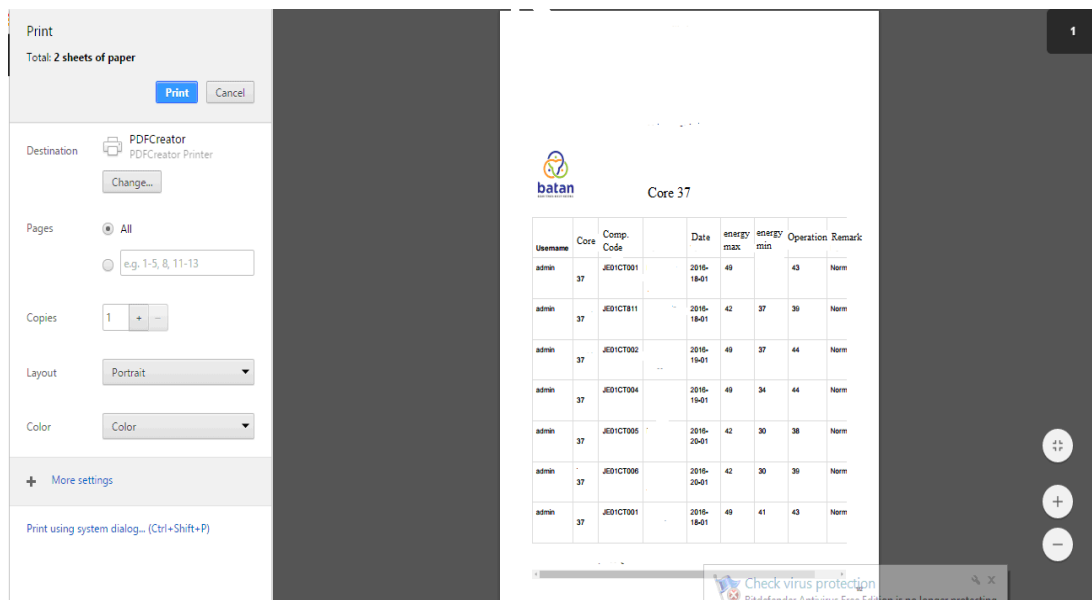


Figure 10. The output of data operation each core

The new database system for RSG-GAS has been created. The admin and certain user can enter data for operation parameter from a certain computer on WEB. The main menu is a dashboard page views. The GUI of operating data forms is used to enter the data operation parameter. The graphics for information operation is a chart of operation data each component. The GUI of scam data form is used to enter the data scam, The table of scam data are consist of collecting of scam data. The output of data operation each core can print in excel or pdf.

CONCLUSION

The RSG-GAS database system for parameter operation was developed by utilizing web-based technologies for data operation RSG-GAS. The system database contains the data and information of parameter operation which can be integrated with some certain user and administration to obtain the information of operation processing RSG-GAS. The system database of RSG-GAS more easy to find the necessary data. By using system database can be monitoring the operation still within the operating limit. The operation of some components is recording on a daily basis graphs. The database system based on WEB is built using Bootstrap framework technology, PHPMySQL.

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DISKUSI/TANYA JAWAB:

1. PERTANYAAN: A. Hafid (PTKRN–BATAN)

- Apakah setiap pegawai dapat mengakses Sistem Manajemen Data Base RSG-GAS?
- Apakah Software data base XAMPP MYPHP dapat mudah diakses?

JAWABAN: Mike S. (PTKRN - BATAN)

- *Untuk mengakses Data base hanya khusus Admin dan Operator Pencatat yang khusus ditunjuk.*
- *Software Data Base berbasis WEB XAMPP MYPHP adalah software yang Open Source*