CERES Production Request Data Base Design Review

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Acknowledgements

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- Jennifer Perez for taking the time to tell us what to expect and what to include, and referring us to Maria Wilson
- Maria Wilson for discussing how to display the schema, and referring us to Stephan.
- Stephan for introducing us to Balsamiq, a Web Mock-up tool that really helped with this presentation
- Joanne Saunders, who faithfully modified diagrams, over and over

CERES Production Request (PR)

- CERES Production Requests (PR) request that a specific range of data dates be processed through specified CERES PGEs in the production environment
- In addition to the data dates, the PR provides information needed to build input and output filenames that are stored in the Process Control File (PCF) accessed by the PGE during run time
- ASDC SIT Team sets up production processing based on the information supplied in the PR, and the ASDC Ops Team implements production

Current Communication of CERES PRs

- CERES PRs have been provided to the ASDC through a PDF version of a Word table.
- There is a Word file for each calendar year containing all the PRs made for that year
- Once entered in the Word table, the PR remains in the file. When completed or canceled, the date is added to the PR and that row is shaded

Sample of a PR in Word File

PR Year & Item_#	PGEs	Instrument (INST)	Input Production Strategy	Output Production Strategy	Begin Datadate to process	End Datadate to process	DAAC Verification (If no CC # provided, use most recent)
6/22/10 – Process Surface Albedo History maps for Edition3 Synoptic SARB Processing (SCCR 794) See note prior to PR 88-10 regarding the Edition3 CC number strategy **Computing Platform: magneto P4** **Environment/runtime variables:** **SS5_MATCH = C4 (dates up through June 2006)** **SS5_MATCH = C5 (dates beginning with July 2006 and forward)**							
104-10	5.0P2	FM1, FM2	PS12=DAO-GEOS4 PS4_5=Edition3A	PS5=Edition3A	7/2/02	2/28/06	CC4_5=300300 CC12= 016023 = 016024 (2/04) = 016025 (4/04) = 016026 (12/04) = 017027 (1/05) = 017028 (12/05) = 018029 (2/06) CC5=300300
103-10	5.0P2	FM1	PS12= DAO-GEOS4 PS4_5=Edition3A	PS5= Edition3A	3/1/2006	6/30/2006	cc4_5=300300 cc12= 018029 cc5=300300
102-10	5.0P2	FM1	PS12=DAO-GEOS4 PS4_5=Edition3A	PS5=Edition3A	7/1/2006	12/31/2007	cc4_5=301300 cc12=018029 =018030 (2/07) cc5=301300

Advances in the Communication of CERES PRs Between Teams

- For several years, many have requested that PR information be stored in a data base
- As an intermediate step, the PRs are being migrated to an Excel spreadsheet that serves the purpose of assisting with the design of the data base and stores the PRs in a format that can be ported to a database. Review is cumbersome, however.
- The spreadsheet/data base approach allows for the orderly addition of new information necessary to specify for production, as well as providing sorting and querying capabilities

Sample of a PR in Spreadsheet

PR #	SCCR	PGE ID	TK Ver P4	SGI	P4	P6	TK Ver P6	X86	TK Ver X86	Satellite	CERES Instrument	Beg Data Date	End Data Date	Input Product Name(s)	Input Product PS	Input Product CC	PGE Output PS	PGE Output CC	Other Variables	Request Date	Req.	Priority /Status	Comments	Special Instruction	Processing Start Date	Processing End Date
104-10	794	5.0P2	15	N	Y	N		N		Terra	FM1, FM2	200207	200602				PS5=Edition3A	CC5=300300	Env: SS5_MATCH=C4	20100622	lhc	990				
														SSFB	PS4_5=Edition3A	CC4_5=300300										
												200207	200401	MOA	PS12=DAO-GEOS4	CC12=016023										
												200402	200403			CC12=016024										
												200404	200411			CC12=016025										
												200412	200412			CC12=016026										
												200501	200511			CC12=017026										
												200512	200601			CC12=017028										
												200602	200602			CC12=018029										
103-10	794	5.0P2	15	N	Y	N		N		Terra	FM1	200603	200606				PS5=Edition3A	CC5=300300	Env: SS5_MATCH=C4	20100622	lhc	990				
														SSFB	PS4_5=Edition3A	CC4_5=300300										
														MOA	PS12=DAO-GEOS4	CC12=018029										
102-10	794	5.0P2	15	N	Y	N		N		Terra	FM1	200607	200712				PS5=Edition3A	CC5=301300	Env: SS5_MATCH=C5	20100622	lhc	990				
														SSFB	PS4_5=Edition3A	CC4_5=301300										
												200607	200701	MOA	PS12=DAO-GEOS4	CC12=018029										
												200702	200712			CC12=018030										

Additional Benefits of Using A Data Base for CERES PRs

- Applications for writing, reviewing, and updating the PRs can be developed, as well as applications to search for specific PRs
- Applications can be written to access file naming information to be passed to the PCF generation process
- Applications can access other sources of information, such as the DPO or other data bases, to help determine components of input file names

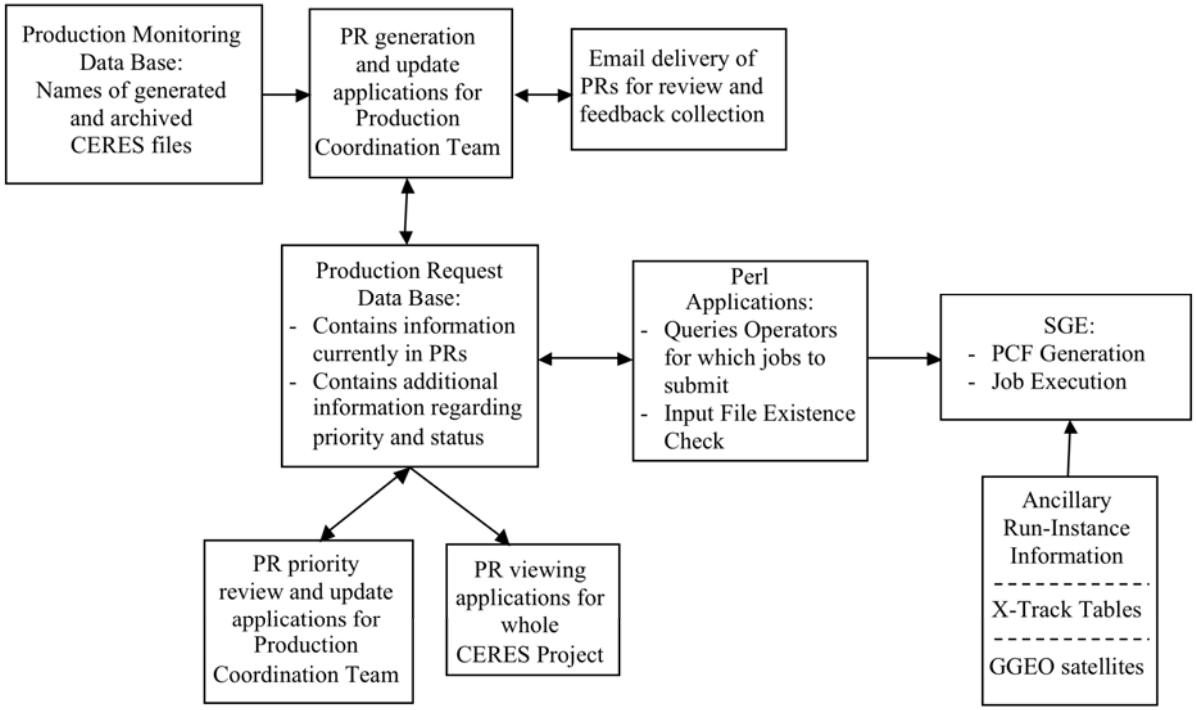
Anatomy of a CERES Filename

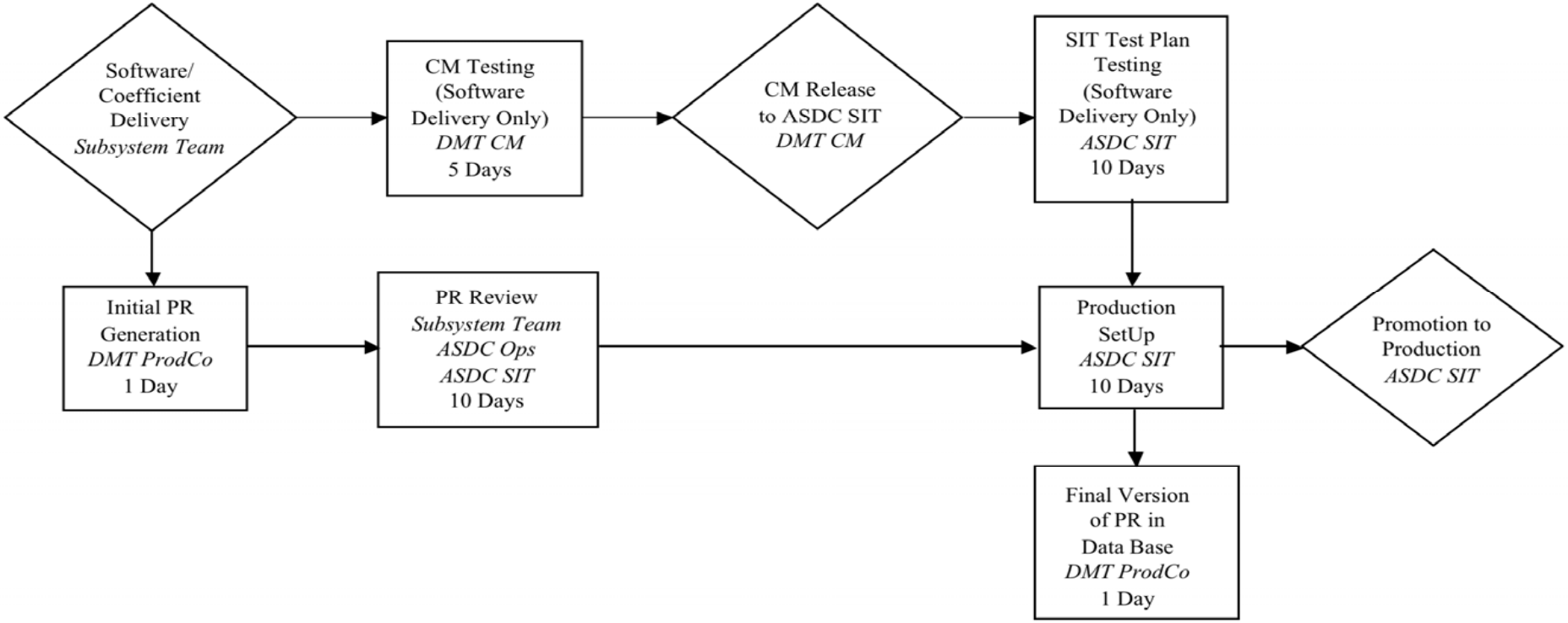
- The standard file naming convention of products generated by the CERES Production System is the following:

"CER"_ProdID_SamplingStrategy_ProductionStrategy_ConfigurationCode.Instance

- All but the 1st two components vary for each product
- The Sampling Strategy is a composite of text strings indicating the source of the external input data used as input to the output product
- The Production Strategy is consistent throughout a data set
- The Configuration Code can change multiple times in a data set as a result of changes to scripts or the operational environment
- Scripts to generate the PCF for each instance define the values for the variable components according to information provided in the PR

PR Database and Interfaces





Flow Diagram of Adding PRs to Data Base

Flow Diagram of Job Submittal Using Data Base and Software Applications

Rough, Rough Schedule

- Finalize a schedule (8/31)
- Complete migration of PRs from Word to Spreadsheet (8/31)
- Settle on Design of PR Data Base, build it, and populate it with test data (8/31)
- Build and independently test applications to populate and access PR data base, while simultaneously building interfaces for job submittal (throughout fall)
- End-to-end testing (early 2011)
- Launch!

Web Interfaces

- Will be developed by a true Web developer
- Will be reviewed and agreed upon by the users before implementation
- The sample slides that follow are intended to simply communicate ideas and are not meant to serve as the design
- The level of intelligence to be phased in, i.e., necessities before bells and whistles

Samples of Possible User Interfaces

CERES Production Request (PR) System

Main Menu

Select One of the Following Options

1. Generate a new PR (must have permission)
2. View an existing PR
3. Approve/Reject a PR (must have permission to approve or reject)
4. Modify an existing PR (must have permission)
5. Search for PRs to submit for processing (must have permission to submit)

CERES PR Generation

PGE Selection and General Information

Select PGE
- CER1
- CER2
- CER3
- etc

Sampling Strategy
- Terra
- Terra-FM1
- Terra-FM1-MODIS
- Aqua
- Aqua-FM3
- Terra+Aqua
- etc

Beginning Data Date

/ /

Ending Data Date

/ /

Select All Applicable Platforms

- ☐ AMI-P6
- ☐ AMI-X86

SCCR Number

Output Production Strategy
- Edition2
- Edition2A
- Edition3
- Edition3A
- etc
- Other

Special Instructions
- Seasonal Months Only
- etc

Output CC Number

CERES PR Generation

PGE 7.2.1P1 - Synoptic SARB Main Processor

PGE-Specific Input Product Filenaming Variables

Input Product - TSIB

Production Strategy
- Edition2G
- Edition3A
- etc
- Other

CC Number
- 300300
- 301300
- 302300
- etc
- Other

Input Product - MOA

Production Strategy
- Edition2G
- Edition3A
- etc
- Other

CC Number
- 300300
- 301300
- 302300
- etc
- Other

Input Product - SNOW, ICE

Production Strategy
- Edition2G
- Edition3A
- etc
- Other

CC Number
- 300300
- 301300
- 302300
- etc
- Other

Additional Variables or Flags

MATCH
- C4
- C5

Variable/Flag 2
- Value1
- Value2

COMMENT - Selection of "Other" results in an additional query

View Existing CERES PRs

Display PRs Based on One or More of the Following

- Subsystem
- PGE
- Priority/Status
- Satellite
- Instrument
- Data Date
- Beginning Processing Date
- Ending Processing Date
- PR number
- Production Strategy

AND THEN...
For each value selected, the User selects from values specific to the selection

Modify an Existing PR

Select One
- Change PR Contents
- Change PR Priority

Select Search Criteria
- All Open PRs
- PRs by PGE
- etc

Results - Make Selection

PR #	PGE ID	Main Output Product	Output PS	Satellite	Date Range	Priority
16-10	9.2P2	SFC-HR	Edition3A	Terra	20000201 - 20100228	3
15-10	9.3P2	SFCB	Edition3A	Terra	20000201 - 20100228	3
14-10	9.4P2	SFC	Edition3A	Terra	20000201 - 2010228	3

Eventually : The User should be able to select one PR, modify it, and automatically be prompted whether to make changes to other PRs that are dependent on the one just modified. For example, if PR 16-10 were selected and modified, the User would be automatically prompted for whether or not 15-10 and 14-10 also needed modification.

Search for PRs Available for Processing

Select First Sort Item

- All Available
- By Priority
- By PGE
- By Production Strategy
- By Satellite
- By Percent Complete
- etc

Select Second Sort Item

- All Available
- By Priority
- By PGE
- By Production Strategy
- By Satellite
- By Percent Complete
- etc

Results - Please Make Selection

PR #	PGE ID	Main Output Product	Output PS	Satellite	Date Range	Priority	Percent Complete	Last Date Submitted
16-10	9.2P2	SFC-HR	Edition3A	Terra	20000201 - 20100301	3	10	20010201
15-10	9.3P2	SFCB	Edition3A	Terra	200002 - 201002	3	10	200101
14-10	9.4P2	SFC	Edition3A	Terra	200002 - 201002	3	10	200101
13-10	5.0P2	SAH	Edition3A	Terra	200002 - 201002	2	50	200601
12-10	4.5-6.5P4	SSF	Edition3A	Terra	20000201 - 20100301	1	75	20070901

PR Review

PR #	PGE ID	SCCR	Sampling Strategy	Output Production Strategy	Output CC Number	Beginning Data Date	Ending Data Date
16-10	9.2P2	999	Terra-MODIS	Edition3A	300300	20000201	20100301

Input PS SSFB	Input CC SSFB	Input PS MOA	Input CC MOA
Edition3A	300300	DAO-GEOS4	222222

Approval/Disapproval - by permission only

- ☐ Approve
- ☐ Reject

Please enter reason for Rejection - email will be sent to the Production Coordination Team

PR Optimization Database Review

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8/18/10

The PR Optimization DB Story

- Introduction
- Database Content
- Database Strategy
- Database Diagrams with Examples
- PR PGE 7.2.1P1 Query Examples
- Database Design Strategy Question
- Questions/Observations
- Open the floor for Questions

Introduction

- The database diagrams for this presentation were made using MySQL Workbench
- The database examples for this presentation were made using CoCoaMySQL.
- The database will be developed for Postgres.
- The initial name of the PR optimization database is ceres_pr_opt.
- PR PGE 7.2.1P1 is the example used for this presentation

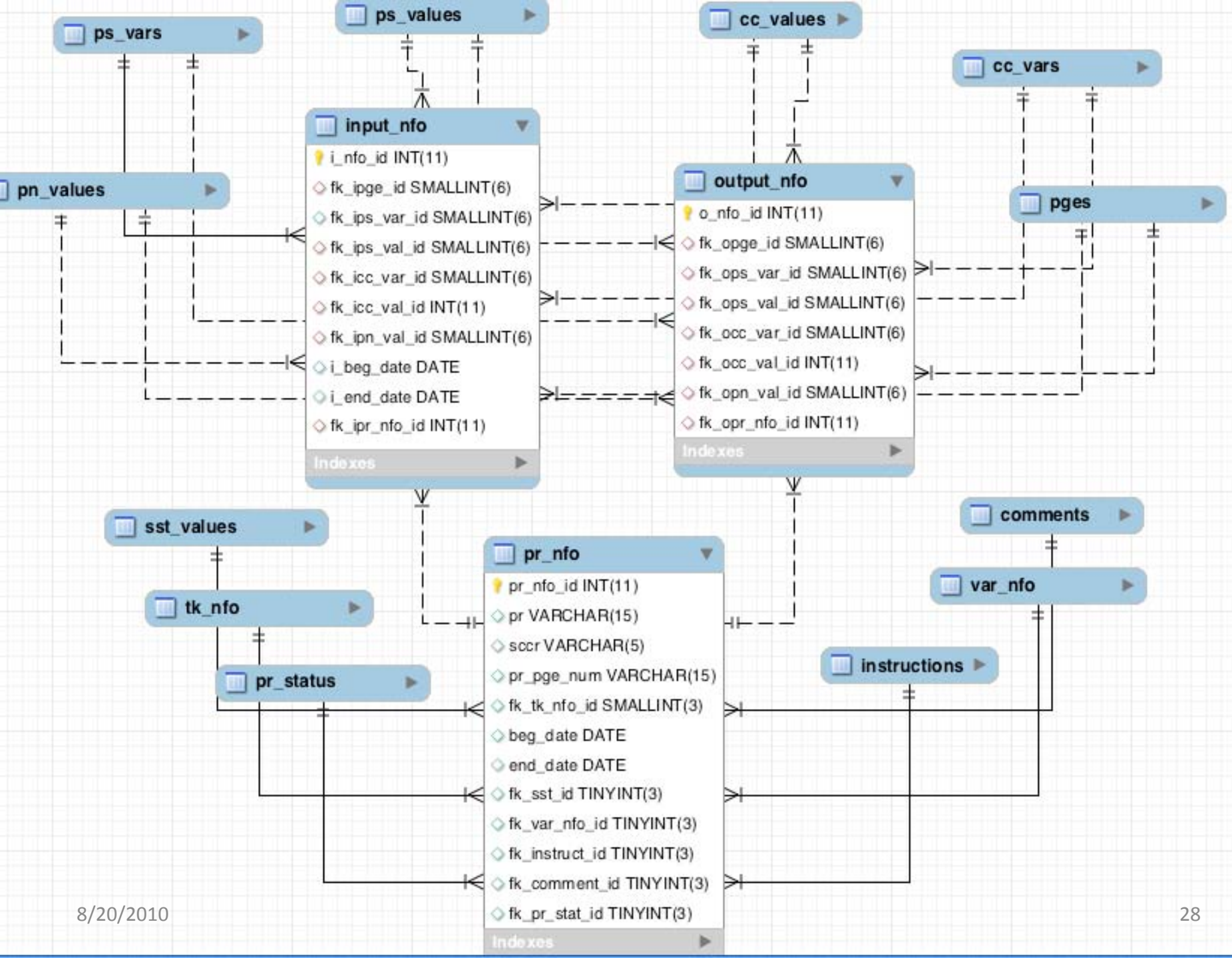
PR Optimization DB Content

- Individual Information:
  - PGEs, Product Names, Production Strategy variables (e.g CC7_1), Production Strategy values, variables (cc7_1), cc values, cc
  - toolkit, sampling strategy, variable, instruction, and comment information
  - PR status information
    - Requestor, request status, request date, process begin date, process end date, percent complete.
- PR PGE Input information
  - Parent PGEs, production strategy variables and values, cc variables and values, beginning and end production dates and product names
  - PR PGE
- PR PGE Output information
  - Target PGE, production strategy variables and values, cc variable and values, and product names
  - PR PGE
- PR information
  - PR, SCCR, PR PGE, dataset begin and end dates,
  - sampling strategy, toolkit, variable, instruction, pr status and comment information

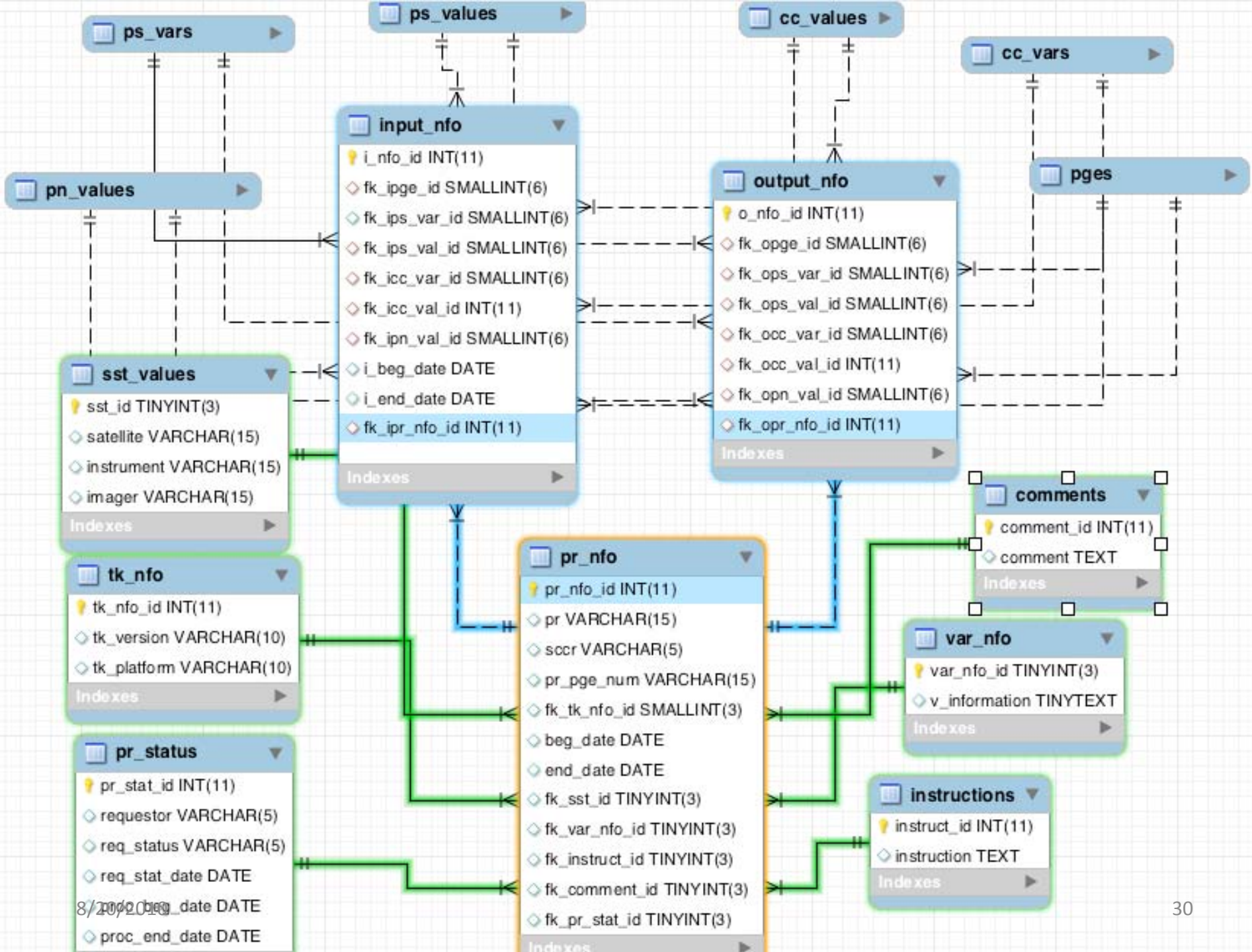
Database Strategy

- PR information Table
  1. Contains an ordered id (1, …N)
     - PR PGE Input/Output Information connects to the PR information thru this id.
  2. Contains PR, SCCR and PR PGE #s, begin data date and end data date
  3. Contains Keys to individual tables:
     - Toolkit, sampling strategy, variable nfo, instructions, pr_status, and comments
- PR PGE Input Information Table
  1. Contains an ordered id (1, …N)
  2. Contains Keys to individual tables:
     - pges, production strategy variable and value, cc variables and values, and product name values
  3. Contains begin and end dates for #2.
  4. Contains the PR ordered id from the PR Information Table
- PR PGE Output Information Table
  1. Same format as PR PGE Input Information Table but no dates
- Individual Tables:
  1. Contain an ordered id (1, …N)
  2. Content (toolkit, sampling strategy, variable, instructions, pr_status, and comments, pges, production strategy variable and value, cc variables and values, and product name values)

PR Optimization Database Diagram


ps_vars
ps_values
cc_values
cc_vars
input_nfo
i_nfo_id INT(11)
fk_ipge_id SMALLINT(6)
fk_ips_var_id SMALLINT(6)
fk_ips_val_id SMALLINT(6)
fk_icc_var_id SMALLINT(6)
fk_icc_val_id INT(11)
fk_ipn_val_id SMALLINT(6)
i_beg_date DATE
i_end_date DATE
fk_ipr_nfo_id INT(11)
Indexes
pn_values
output_nfo
o_nfo_id INT(11)
fk_opge_id SMALLINT(6)
fk_ops_var_id SMALLINT(6)
fk_ops_val_id SMALLINT(6)
fk_occ_var_id SMALLINT(6)
fk_occ_val_id INT(11)
fk_opn_val_id SMALLINT(6)
fk_opr_nfo_id INT(11)
Indexes
pges
sst_values
comments
pr_nfo
pr_nfo_id INT(11)
pr VARCHAR(15)
sccr VARCHAR(5)
pr_pge_num VARCHAR(15)
fk_tk_nfo_id SMALLINT(3)
beg_date DATE
end_date DATE
fk_sst_id TINYINT(3)
fk_var_nfo_id TINYINT(3)
fk_instruct_id TINYINT(3)
fk_comment_id TINYINT(3)
fk_pr_stat_id TINYINT(3)
Indexes
var_nfo
tk_nfo
instructions
pr_status

The PR Information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ps_values
cc_values
cc_vars
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fk_ipge_id SMALLINT(6)
fk_ips_var_id SMALLINT(6)
fk_ips_val_id SMALLINT(6)
fk_icc_var_id SMALLINT(6)
fk_icc_val_id INT(11)
fk_ipn_val_id SMALLINT(6)
i_beg_date DATE
i_end_date DATE
fk_ipr_nfo_id INT(11)
Indexes
pn_values
output_nfo
o_nfo_id INT(11)
fk_opge_id SMALLINT(6)
fk_ops_var_id SMALLINT(6)
fk_ops_val_id SMALLINT(6)
fk_occ_var_id SMALLINT(6)
fk_occ_val_id INT(11)
fk_opn_val_id SMALLINT(6)
fk_opr_nfo_id INT(11)
Indexes
pges
sst_values
sst_id TINYINT(3)
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instrument VARCHAR(15)
imager VARCHAR(15)
Indexes
comments
comment_id INT(11)
comment TEXT
Indexes
tk_nfo
tk_nfo_id INT(11)
tk_version VARCHAR(10)
tk_platform VARCHAR(10)
Indexes
pr_nfo
pr_nfo_id INT(11)
pr VARCHAR(15)
sccr VARCHAR(5)
pr_pge_num VARCHAR(15)
fk_tk_nfo_id SMALLINT(3)
beg_date DATE
end_date DATE
fk_sst_id TINYINT(3)
fk_var_nfo_id TINYINT(3)
fk_instruct_id TINYINT(3)
fk_comment_id TINYINT(3)
fk_pr_stat_id TINYINT(3)
Indexes
var_nfo
var_nfo_id TINYINT(3)
v_information TINYTEXT
Indexes
pr_status
pr_stat_id INT(11)
requestor VARCHAR(5)
req_status VARCHAR(5)
req_stat_date DATE
proc_beg_date DATE
proc_end_date DATE
instructions
instruct_id INT(11)
instruction TEXT
Indexes

PR Information Table Example (PGE 7.2.1P1)

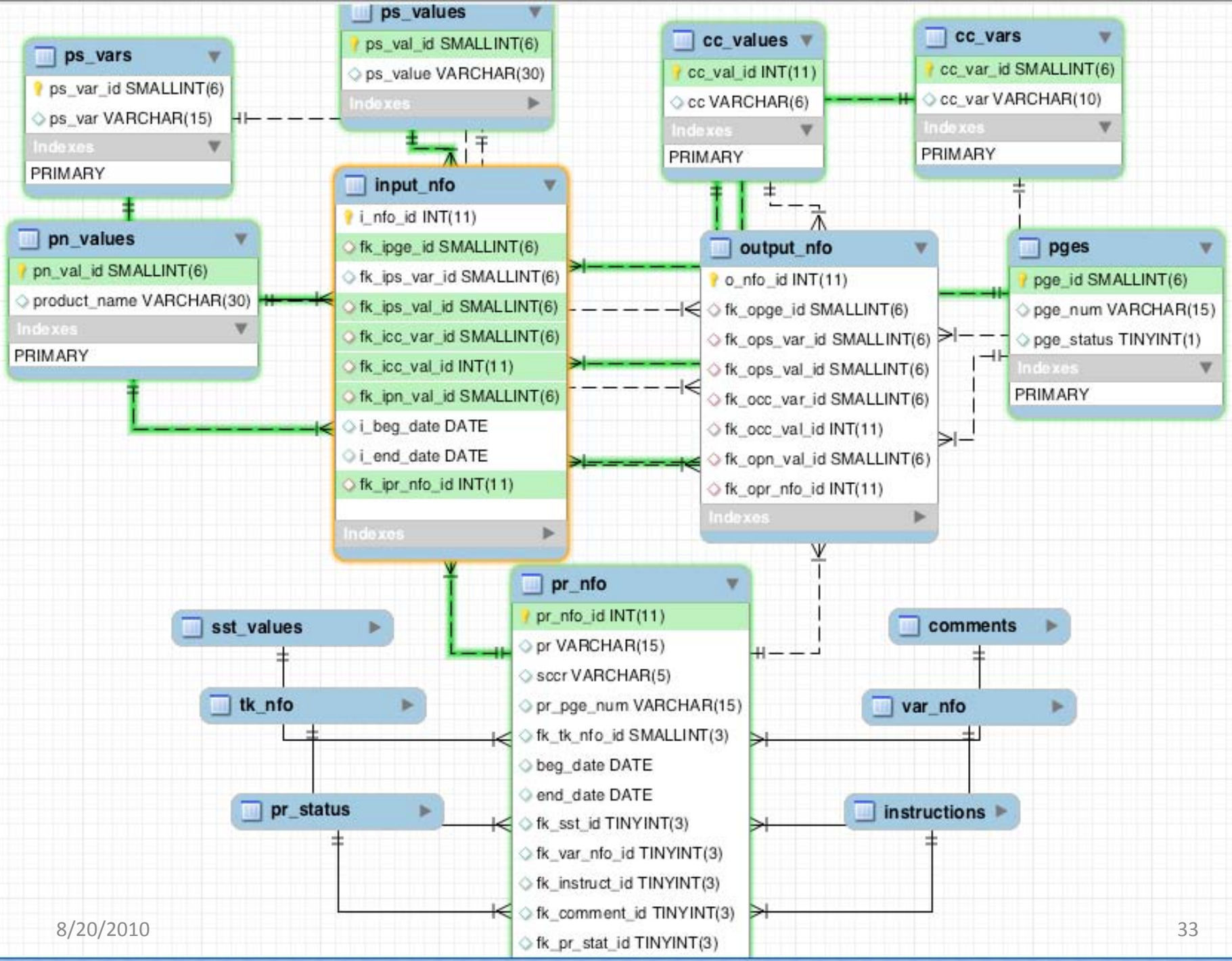
Queried Data

```
SELECT pr_nfo_id, pr, sccr, pr_pge_num, tk_version, tk_platform, beg_date, end_date, satellite, instrument, imager, v_information, instruction,
comment, requestor, req_status FROM pr_nfo, tk_nfo, sst_values, var_nfo, instructions, comments, pr_status WHERE fk_tk_nfo_id = tk_nfo_id and
fk_sst_id = sst_id and fk_var_nfo_id = var_nfo_id and fk_comment_id = comment_id and fk_pr_stat_id = pr_stat_id;
```

pr_nfo_id	pr	sccr	pr_pge_num	tk_version	tk_platform	beg_date	end_date	satellite	instrument	imager
1	08-10	910	7.2.1P1	16	P4	2000-03-01	2010-07-31	Terra	FM1, FM2	NULL

v_information	instruction	comment	requestor	req_status
Variable information 1	instructions 1	comment 1	cog	999

The PR PGE Input Information


ps_vars
ps_var_id SMALLINT(6)
ps_var VARCHAR(15)
Indexes
PRIMARY
ps_values
ps_val_id SMALLINT(6)
ps_value VARCHAR(30)
Indexes
cc_values
cc_val_id INT(11)
cc VARCHAR(6)
Indexes
PRIMARY
cc_vars
cc_var_id SMALLINT(6)
cc_var VARCHAR(10)
Indexes
PRIMARY
pn_values
pn_val_id SMALLINT(6)
product_name VARCHAR(30)
Indexes
PRIMARY
input_nfo
i_nfo_id INT(11)
fk_ipge_id SMALLINT(6)
fk_ips_var_id SMALLINT(6)
fk_ips_val_id SMALLINT(6)
fk_icc_var_id SMALLINT(6)
fk_icc_val_id INT(11)
fk_ipn_val_id SMALLINT(6)
i_beg_date DATE
i_end_date DATE
fk_ipr_nfo_id INT(11)
Indexes
output_nfo
o_nfo_id INT(11)
fk_opge_id SMALLINT(6)
fk_ops_var_id SMALLINT(6)
fk_ops_val_id SMALLINT(6)
fk_occ_var_id SMALLINT(6)
fk_occ_val_id INT(11)
fk_opn_val_id SMALLINT(6)
fk_opr_nfo_id INT(11)
Indexes
pges
pge_id SMALLINT(6)
pge_num VARCHAR(15)
pge_status TINYINT(1)
Indexes
PRIMARY
pr_nfo
pr_nfo_id INT(11)
pr VARCHAR(15)
sccr VARCHAR(5)
pr_pge_num VARCHAR(15)
fk_tk_nfo_id SMALLINT(3)
beg_date DATE
end_date DATE
fk_sst_id TINYINT(3)
fk_var_nfo_id TINYINT(3)
fk_instruct_id TINYINT(3)
fk_comment_id TINYINT(3)
fk_pr_stat_id TINYINT(3)
sst_values
tk_nfo
pr_status
comments
var_nfo
instructions

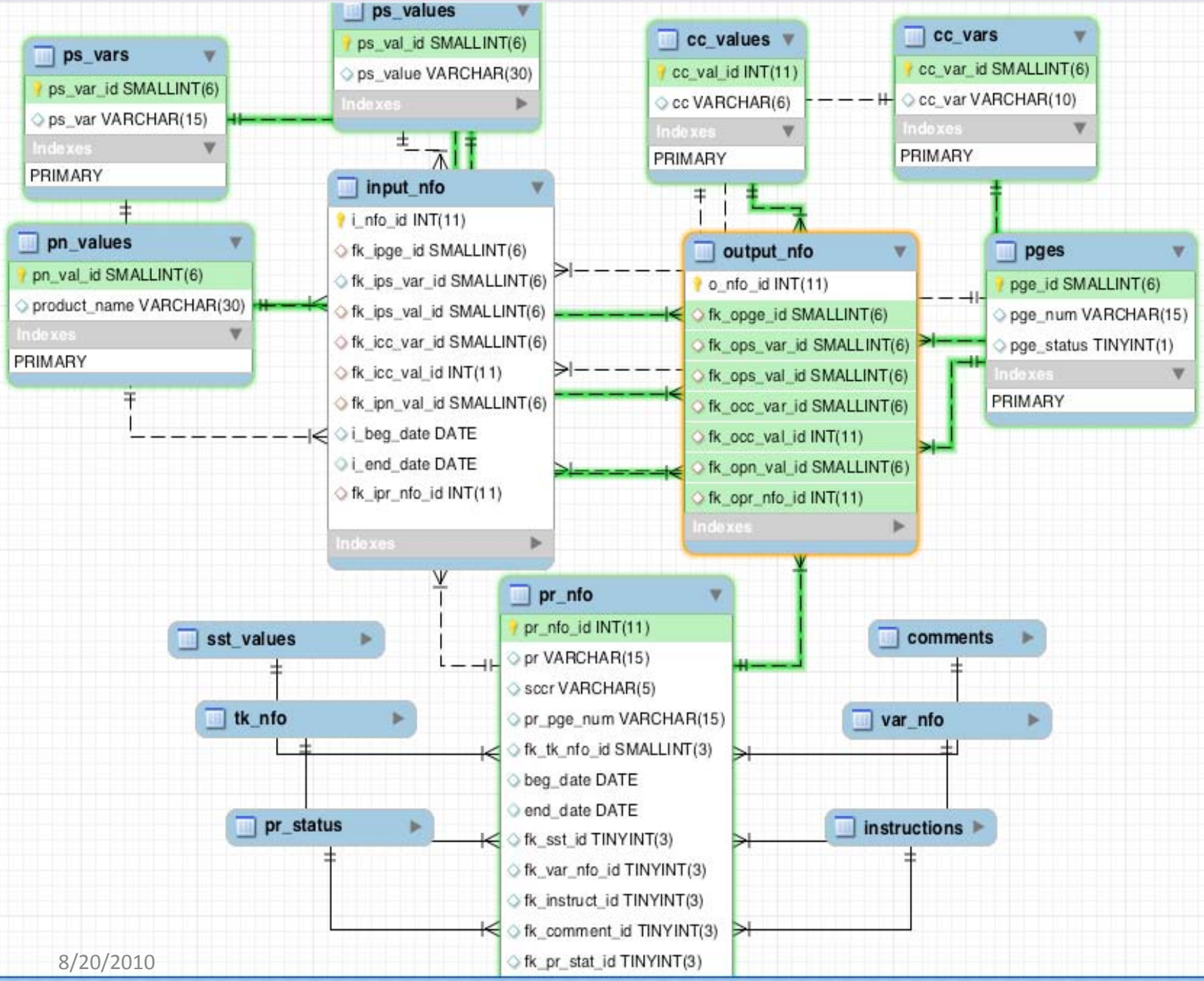
PR PGE Input Table Example (PGE 7.2.1P1)

Queried data

```
SELECT i_nfo_id, pge_num, ps_var, ps_value, cc_var, cc, product_name, i_beg_date, i_end_date, fk_ipr_nfo_id FROM pr_nfo, pges, input_nfo, ps_vars, ps_values, cc_vars, cc_values, pn_values WHERE fk_ipr_nfo_id = pr_nfo_id and fk_ips_var_id = ps_var_id and fk_ips_val_id = ps_val_id and fk_icc_var_id = cc_var_id and fk_icc_val_id = cc_val_id and fk_ipn_val_id = pn_val_id and fk_ipge_id=pge_id;
```

i_nfo_id	pge_num	ps_var	ps_value	cc_var	cc	product_name	i_beg_date	i_end_date	fk_ipr_nfo_id
9	7.1.1P1	PS7_1	Edition2C	CC7_1	013018	TSIB	2000-03-01	2005-10-31	1
10	12.1P1	PS12	DAO-G5-CERES	CC12	020032	MOA	2007-09-30	0000-00-00	1
11	5.0P2	PS7_2	N/A	CC7_2	000000	SAH	0000-00-00	0000-00-00	1
12	4.1-4.2P4	PS4_2	N/A	CC4_2	000000	ECS-OA0063m	0000-00-00	0000-00-00	1
13	4.1-4.2P4	PS4_2	N/A	CC4_2	000000	ECS-OA016m	0000-00-00	0000-00-00	1
14	4.1-4.0P1	PS4_0	NSIDC-NESDIS	CC4_0	022029	EICE	2009-08-31	2010-07-29	1
15	4.1-4.0P1	PS4_0	NSIDC-NESDIS	CC4_0	023031	ESNOW	2009-08-31	2010-07-29	1

The PR PGE Output Information


ps_vars
ps_var_id SMALLINT(6)
ps_var VARCHAR(15)
Indexes
PRIMARY
ps_values
ps_val_id SMALLINT(6)
ps_value VARCHAR(30)
Indexes
cc_values
cc_val_id INT(11)
cc VARCHAR(6)
Indexes
PRIMARY
cc_vars
cc_var_id SMALLINT(6)
cc_var VARCHAR(10)
Indexes
PRIMARY
pn_values
pn_val_id SMALLINT(6)
product_name VARCHAR(30)
Indexes
PRIMARY
input_nfo
i_nfo_id INT(11)
fk_ipge_id SMALLINT(6)
fk_ips_var_id SMALLINT(6)
fk_ips_val_id SMALLINT(6)
fk_icc_var_id SMALLINT(6)
fk_icc_val_id INT(11)
fk_ipn_val_id SMALLINT(6)
i_beg_date DATE
i_end_date DATE
fk_ipr_nfo_id INT(11)
Indexes
output_nfo
o_nfo_id INT(11)
fk_opge_id SMALLINT(6)
fk_ops_var_id SMALLINT(6)
fk_ops_val_id SMALLINT(6)
fk_occ_var_id SMALLINT(6)
fk_occ_val_id INT(11)
fk_opn_val_id SMALLINT(6)
fk_opr_nfo_id INT(11)
Indexes
pges
pge_id SMALLINT(6)
pge_num VARCHAR(15)
pge_status TINYINT(1)
Indexes
PRIMARY
pr_nfo
pr_nfo_id INT(11)
pr VARCHAR(15)
sccr VARCHAR(5)
pr_pge_num VARCHAR(15)
fk_tk_nfo_id SMALLINT(3)
beg_date DATE
end_date DATE
fk_sst_id TINYINT(3)
fk_var_nfo_id TINYINT(3)
fk_instruct_id TINYINT(3)
fk_comment_id TINYINT(3)
fk_pr_stat_id TINYINT(3)
sst_values
tk_nfo
pr_status
comments
var_nfo
instructions

PR PGE Output Table Example (PGE 7.2.1P1)

Queried data

```
SELECT o_nfo_id, pge_num, ps_var, ps_value, cc_var, cc, product_name, fk_opr_nfo_id FROM pr_nfo, pges, output_nfo, ps_vars, ps_values, cc_vars,
cc_values, pn_values WHERE fk_opr_nfo_id = pr_nfo_id and fk_ops_var_id = ps_var_id and fk_ops_val_id = ps_val_id and fk_occ_var_id = cc_var_id and
fk_occ_val_id = cc_val_id and fk_opn_val_id = pn_val_id and fk_opge_id=pge_id;
```

o_nfo_id	pge_num	ps_var	ps_value	cc_var	cc	product_name	fk_opr_nfo_id
4	8.1P1	PS7_2	Edition2C	CC7_2	004007	SYNI	1
5	N/A	PS7_2	Edition2C	CC7_2	004007	SYNS	1
6	N/A	PS7_2	Edition2C	CC7_2	004007	KQCR	1

PR PGE 7.2.1P1 Query Examples

Query of PR, PR PGE, and Input Information (PGE 7.2.1P1)

Queried data

```
SELECT pr, pr_pge_num, pge_num, ps_var, ps_value, cc_var, cc, product_name, i_beg_date, i_end_date FROM pr_nfo, pges, input_nfo, ps_vars,
ps_values, cc_vars, cc_values, pn_values WHERE fk_ipr_nfo_id = pr_nfo_id and fk_ips_var_id = ps_var_id and fk_ips_val_id = ps_val_id and fk_icc_var_id
= cc_var_id and fk_icc_val_id = cc_val_id and fk_ipn_val_id = pn_val_id and fk_ipge_id=pge_id;
```

pr	pr_pge_num	pge_num	ps_var	ps_value	cc_var	cc	product_name	i_beg_date	i_end_date
08-10	7.2.1P1	7.1.1P1	PS7_1	Edition2C	CC7_1	013018	TSIB	2000-03-01	2005-10-31
08-10	7.2.1P1	12.1P1	PS12	DAO-G5-CERES	CC12	020032	MOA	2007-09-30	0000-00-00
08-10	7.2.1P1	5.0P2	PS7_2	N/A	CC7_2	000000	SAH	0000-00-00	0000-00-00
08-10	7.2.1P1	4.1-4.2P4	PS4_2	N/A	CC4_2	000000	ECS-OA0063m	0000-00-00	0000-00-00
08-10	7.2.1P1	4.1-4.2P4	PS4_2	N/A	CC4_2	000000	ECS-OA016m	0000-00-00	0000-00-00
08-10	7.2.1P1	4.1-4.0P1	PS4_0	NSIDC-NESDIS	CC4_0	022029	EICE	2009-08-31	2010-07-29
08-10	7.2.1P1	4.1-4.0P1	PS4_0	NSIDC-NESDIS	CC4_0	023031	ESNOW	2009-08-31	2010-07-29

Query of PR, PR PGE, and Output Information (PGE 7.2.1P1)

Queried data

```
SELECT pr, pr_pge_num, pge_num, ps_var, ps_value, cc_var, cc, product_name, beg_date, end_date FROM pr_nfo, pges, output_nfo, ps_vars, ps_values,
cc_vars, cc_values, pn_values WHERE fk_opr_nfo_id = pr_nfo_id and fk_ops_var_id = ps_var_id and fk_ops_val_id = ps_val_id and fk_occ_var_id =
cc_var_id and fk_occ_val_id = cc_val_id and fk_opn_val_id = pn_val_id and fk_opge_id=pge_id;
```

pr	pr_pge_num	pge_num	ps_var	ps_value	cc_var	cc	product_name	beg_date	end_date
08-10	7.2.1P1	8.1P1	PS7_2	Edition2C	CC7_2	004007	SYNI	2000-03-01	2010-07-31
08-10	7.2.1P1	N/A	PS7_2	Edition2C	CC7_2	004007	SYNS	2000-03-01	2010-07-31
08-10	7.2.1P1	N/A	PS7_2	Edition2C	CC7_2	004007	KQCR	2000-03-01	2010-07-31

Database Design Question

- Use an Input table and Output table that contains all the subsystems i/o information:
  - Advantage
    - Only 2 tables to query (input/output)
  - Disadvantage
    - Initial import of i/o tables not as easy to build
    - Many rows
    - Maybe missing advantage of input/output SS_PS_CC patterns of subsystems
    - The i/o tables could be normalized more by subsystems
- Break out Input/Output Information Tables by Subsystems:
  - Advantage
    - More normalization
    - Easier to load/import data into the tables
    - Take advantage of input/output SS_PS_CC patterns of subsystems
  - Disadvantage
    - more tables to use in queries

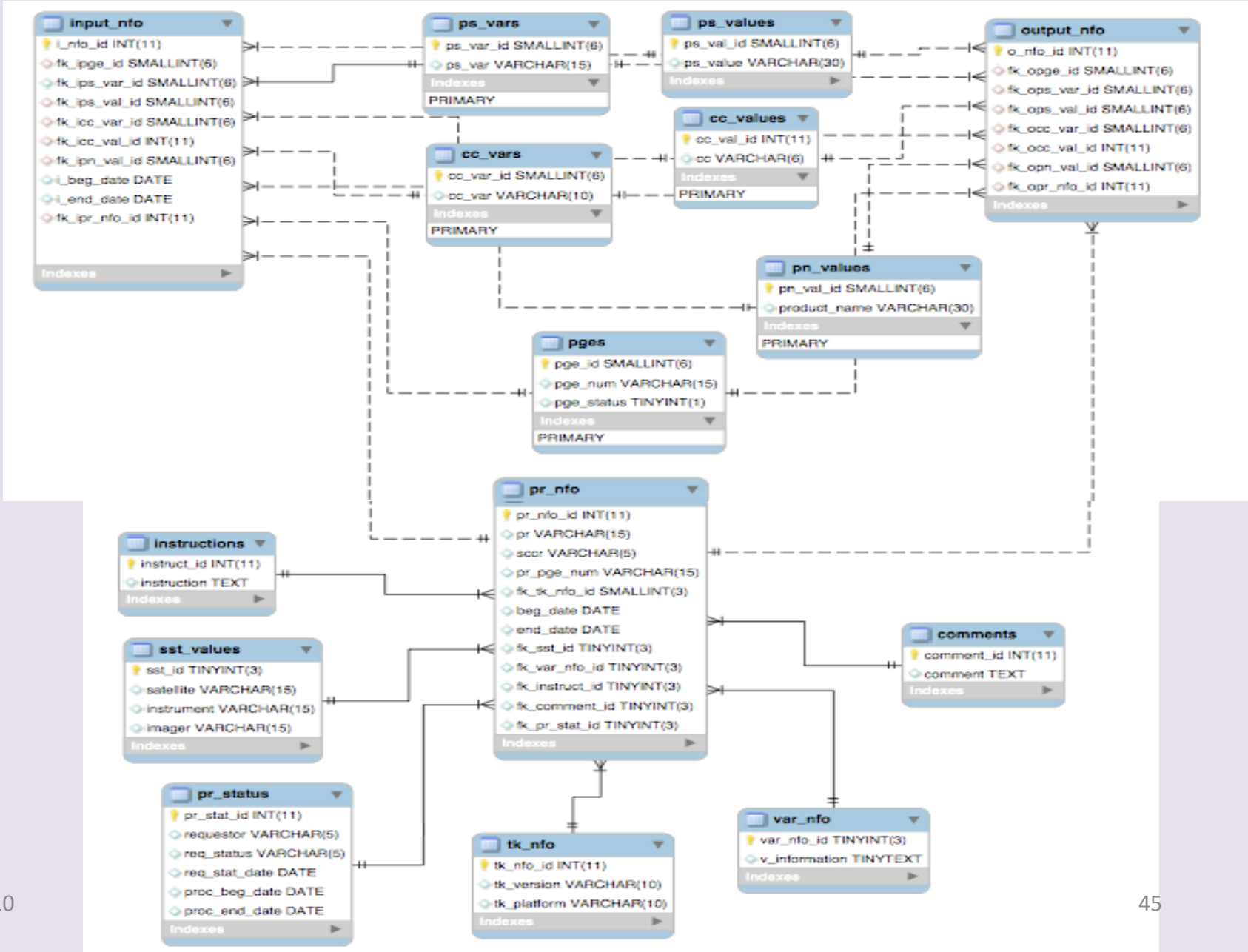
Questions/Observations

- How to handle products like ECS –OA00m, or EM0855:
  - Place in product table or separate table?
  - Are there begin and end dates for these products?
- For output products:
  - Will the cc values equal and the ps values equal?
  - Noticed the ps variables equal and the cc variables equal.
- For the Sampling strategy:
  - Is it sufficient to use one sampling strategy or
  - Use one sampling strategy / input product?

Questions

Back Up Slides

PR Optimization Diagram



PR Information Table (pr_nfo)

Field	Type	Length	unsigned	zerofill	binary	Null	Key
pr_nfo_id	int	11	☑	☐	☐	NO	PRI
pr	varchar	15	☐	☐	☐	YES	
sccr	varchar	5	☐	☐	☐	YES	
pr_pge_num	varchar	15	☐	☐	☐	YES	
fk_tk_nfo_id	smallint	3	☐	☐	☐	YES	MUL
beg_date	date		☐	☐	☐	YES	
end_date	date		☐	☐	☐	YES	
fk_sst_id	tinyint	3	☐	☐	☐	YES	MUL
fk_var_nfo_id	tinyint	3	☐	☐	☐	YES	MUL
fk_instruct_id	tinyint	3	☐	☐	☐	YES	MUL
fk_comment_id	tinyint	3	☐	☐	☐	YES	MUL
fk_pr_stat_id	tinyint	3	☐	☐	☐	YES	MUL

KEY Values

Key_name	Seq_in_index	Column_name
PRIMARY	1	pr_nfo_id
sst_id	1	fk_sst_id
var_nfo_id	1	fk_var_nfo_id
instruct_id	1	fk_instruct_id
comment_id	1	fk_comment_id
pr_stat_id	1	fk_pr_stat_id
tk_nfo_id	1	fk_tk_nfo_id

PR Information Table (pr_info)

- PR information id (pr_nfo_id)– integer, primary
- PR number (pr)– varchar ( )
- SCCR number (sccr) – varchar ( )
- PR PGE number (pr_pge_num) – varchar( ), e.g. 7.2.1P1
- Key to the ToolKit Table value – integer
  - fk_tk_nfo_id -> tk_nfo_id
- Begin Date – date, yyyy-mm-dd
- End Date – date, yyyy-mm--dd
- Key to the Sampling Strategy value– integer
  - fk_sst_id -> sst_id
- Key to the Variable information table – integer
  - fk_var_nfo_id -> var_nfo_id
- Key to the Instructions table – integer
  - fk_instruct_id -> instruct_id
- Key to the Comments table – integer
  - fk_comment_id -> comment_id
- Key to the Status table – integer
  - fk_pr_stat_id -> pr_stat_id

PR Information Table Example (pr_nfo)

pr_nfo_id	pr	sccr	pr_pge_num	fk_tk_nfo	beg_date	end_date	fk_sst_id
1	08-10	910	7.2.1P1	2	2000-03-01	2010-07-31	13

fk_var_nfo_id	fk_instruct_id	fk_comment_id	fk_pr_stat_id
1	1	1	1

Queried Data

```
SELECT pr_nfo_id, pr, sccr, pr_pge_num, tk_version, tk_platform, beg_date, end_date, satellite, instrument, imager, v_information, instruction,
comment, requestor, req_status FROM pr_nfo, tk_nfo, sst_values, var_nfo, instructions, comments, pr_status WHERE fk_tk_nfo_id = tk_nfo_id and
fk_sst_id = sst_id and fk_var_nfo_id = var_nfo_id and fk_comment_id = comment_id and fk_pr_stat_id = pr_stat_id;
```

pr_nfo_id	pr	sccr	pr_pge_num	tk_version	tk_platform	beg_date	end_date	satellite	instrument	imager
1	08-10	910	7.2.1P1	16	P4	2000-03-01	2010-07-31	Terra	FM1, FM2	NULL

v_information	instruction	comment	requestor	req_status
Variable information 1	instructions 1	comment 1	cog	999

Toolkit Information Table (tk_nfo)

Field	Type	Length	unsigned	zerofill	binary	Null	Key
tk_nfo_id	int	11	☑	☐	☐	NO	PRI
tk_version	varchar	10	☐	☐	☐	YES	
tk_platform	varchar	10	☐	☐	☐	YES	

EXAMPLE

tk_nfo_id	tk_version	tk_platform
1	15	P4
2	16	P4
3	16	P6
4	16	x86

Sampling Strategy Table (sst_values)

Field	Type	Length	unsigned	zerofill	binary	Null	Key	Default	Extra
id	tinyint	3	☑	☐	☐	NO	PRI	NULL	auto_increment
satellite	varchar	15	☐	☐	☐	YES		NULL	None
instrument	varchar	15	☐	☐	☐	YES		NULL	None
imager	varchar	15	☐	☐	☐	YES		NULL	None

EXAMPLE

sst_id	satellite	instrument	imager
0	N/A	N/A	N/A
1	Terra	FM1	NULL
2	Terra	FM2	NULL
3	Aqua	FM3	NULL
4	Terra	FM1	MODIS
5	Aqua	FM4	NULL
6	Terra	FM2	MODIS
7	Aqua	FM3	MODIS
8	Aqua	FM4	MODIS
9	Terra + Aqua	FM1+FM3	MODIS
10	Terra + Aqua	FM2+FM3	MODIS
11	Terra + Aqua	FM1+FM3	NULL
13	Terra	FM1, FM2	NULL
14	Aqua	FM3, FM4	NULL
15	Terra	FM1,FM2	MODIS
16	Aqua	FM3, FM4	MODIS

Variables Information Table (var_nfo)

Field	Type	Length	unsigned	zerofill	binary	Null	Key
var_nfo_id	tinyint	3	☑	☐	☐	NO	PRI
v_information	tinytext		☐	☐	☐	YES	

EXAMPLE

var_nfo_id	v_information
1	Variable information 1

Instructions Table (instructions)

Field	Type	Length	unsigned	zerofill	binary	Null	Key
instruct_id	int	11	☑	☐	☐	NO	PRI
instruction	text		☐	☐	☐	YES	

EXAMPLE

instruct_id	instruction
1	instructions 1

Comments Table (comments)

Field	Type	Length	unsigned	zerofill	binary	Null	Key
comment_id	int	11	☑	☐	☐	NO	PRI
comment	text		☐	☐	☐	YES	

EXAMPLE

comment_id	comment
1	comment 1

PR Status Table (pr_status)

- status_id – integer, primary
- Requestor – varchar ( )
- Request Status – varchar( )
- Request Date – date
- Process Begin Date – date
- Process End Date – date

PR Status Table Example (pr_status)

Field	Type	Length	unsigned	zerofill	binary	Null	Key
pr_stat_id	int	11	☑	☐	☐	NO	PRI
requestor	varchar	5	☐	☐	☐	YES	
req_status	varchar	5	☐	☐	☐	YES	
req_stat_date	date		☐	☐	☐	YES	
proc_beg_date	date		☐	☐	☐	YES	
proc_end_date	date		☐	☐	☐	YES	

EXAMPLE

pr_stat_id	requestor	req_status	req_stat_date	proc_beg_date	proc_end_date
1	cog	999	2010-07-18	0000-00-00	0000-00-00

PGE Input/Output Tables

- Input information – input_info
- Output information – output_info

PGE Input Table (input_info)

Field	Type	Length	unsigned	zerofill	binary	Null	Key
i_nfo_id	int	11	☑	☐	☐	NO	PRI
fk_ipge_id	smallint	6	☑	☐	☐	YES	MUL
fk_ips_var_id	smallint	6	☑	☐	☐	YES	MUL
fk_ips_val_id	smallint	6	☑	☐	☐	YES	MUL
fk_icc_var_id	smallint	6	☑	☐	☐	YES	MUL
fk_icc_val_id	int	11	☑	☐	☐	YES	MUL
fk_ipn_val_id	smallint	6	☑	☐	☐	YES	MUL
i_beg_date	date		☐	☐	☐	YES	
i_end_date	date		☐	☐	☐	YES	
fk_ipr_nfo_id	int	11	☑	☐	☐	YES	MUL

KEY Values

Key_name	Seq_in_index	Column_name
PRIMARY	1	i_nfo_id
pge_id	1	fk_ipge_id
ps_var_id	1	fk_ips_var_id
ps_val_id	1	fk_ips_val_id
cc_var_id	1	fk_icc_var_id
cc_val_id	1	fk_icc_val_id
pn_val_id	1	fk_ipn_val_id
pr_nfo_id	1	fk_ipr_nfo_id

PGE Input Table (input_info)

- Input PGE id (i_nfo_id) – integer, primary
- Key to the Parent/Input PGE – integer
  - fk_ipge_id -> pge_id
- Key to the Input production strategy variable – integer
  - fk_ips_var_id -> ps_var_id
- Key to the Input production strategy value – integer
  - fk_ips_val_id -> ps_val_id
- Key to the Input CC variable – integer
  - fk_icc_var_id -> cc_var_id
- Key to the Input CC value – integer
  - fk_icc_val_id -> cc_val_id
- Key to the Product Name – integer
  - fk_ipn_id -> pn_id
- Begin Date – date
  - i_beg_date
- End Date – date
  - i_end_date
- Key to the PR table – integer
  - fk_ipr_nfo_id -> pr_nfo_id

PGE Input Table Example (PGE 7.2.1P1)

i_nfo_id	fk_ipge_id	fk_ips_var_id	fk_ips_val_id	fk_icc_var_id	fk_icc_val_id	fk_ipn_val_id	i_beg_date	i_end_date	fk_ipr_nfo_id
9	70	14	10	29	12	14	2000-03-01	2005-10-31	1
10	101	22	20	43	27	19	2007-09-30	0000-00-00	1
11	61	15	0	30	0	23	0000-00-00	0000-00-00	1
12	35	9	0	16	0	24	0000-00-00	0000-00-00	1
13	35	9	0	16	0	25	0000-00-00	0000-00-00	1
14	24	7	23	44	5	5	2009-08-31	2010-07-29	1
15	24	7	23	44	6	6	2009-08-31	2010-07-29	1

Queried data

```
SELECT i_nfo_id, pge_num, ps_var, ps_value, cc_var, cc, product_name, i_beg_date, i_end_date, fk_ipr_nfo_id FROM pr_nfo, pges, input_nfo, ps_vars, ps_values, cc_vars, cc_values, pn_values WHERE fk_ipr_nfo_id = pr_nfo_id and fk_ips_var_id = ps_var_id and fk_ips_val_id = ps_val_id and fk_icc_var_id = cc_var_id and fk_icc_val_id = cc_val_id and fk_ipn_val_id = pn_val_id and fk_ipge_id=pge_id;
```

i_nfo_id	pge_num	ps_var	ps_value	cc_var	cc	product_name	i_beg_date	i_end_date	fk_ipr_nfo_id
9	7.1.1P1	PS7_1	Edition2C	CC7_1	013018	TSIB	2000-03-01	2005-10-31	1
10	12.1P1	PS12	DAO-G5-CERES	CC12	020032	MOA	2007-09-30	0000-00-00	1
11	5.0P2	PS7_2	N/A	CC7_2	000000	SAH	0000-00-00	0000-00-00	1
12	4.1-4.2P4	PS4_2	N/A	CC4_2	000000	ECS-OA0063m	0000-00-00	0000-00-00	1
13	4.1-4.2P4	PS4_2	N/A	CC4_2	000000	ECS-OA016m	0000-00-00	0000-00-00	1
14	4.1-4.0P1	PS4_0	NSIDC-NESDIS	CC4_0	022029	EICE	2009-08-31	2010-07-29	1
15	4.1-4.0P1	PS4_0	NSIDC-NESDIS	CC4_0	023031	ESNOW	2009-08-31	2010-07-29	1

PGE Output Table (output_info)

Field	Type	Length	unsigned	zerofill	binary	Null	Key
o_nfo_id	int	11	☑	☐	☐	NO	PRI
fk_opge_id	smallint	6	☑	☐	☐	YES	MUL
fk_ops_var_id	smallint	6	☑	☐	☐	YES	MUL
fk_ops_val_id	smallint	6	☑	☐	☐	YES	MUL
fk_occ_var_id	smallint	6	☑	☐	☐	YES	MUL
fk_occ_val_id	int	11	☑	☐	☐	YES	MUL
fk_opn_val_id	smallint	6	☑	☐	☐	YES	MUL
fk_opr_nfo_id	int	11	☑	☐	☐	YES	MUL

KEY Values

Key_name	Seq_in_index	Column_name
PRIMARY	1	o_nfo_id
pge_id	1	fk_opge_id
ps_var_id	1	fk_ops_var_id
ps_val_id	1	fk_ops_val_id
cc_var_id	1	fk_occ_var_id
cc_val_id	1	fk_occ_val_id
pn_val_id	1	fk_opn_val_id
pr_nfo_id	1	fk_opr_nfo_id

PGE Output Table (output_info)

- Output PGE id (o_nfo_id) – integer, primary
- Key to the Parent/Input PGE – integer
  - fk_opge_id -> pge_id
- Key to the Input production strategy variable – integer
  - fk_ops_var_id -> ps_var_id
- Key to the Input production strategy value – integer
  - fk_ops_val_id -> ps_val_id
- Key to the Input CC variable – integer
  - fk_occ_var_id -> cc_var_id
- Key to the Input CC value – integer
  - fk_occ_val_id -> cc_val_id
- Key to the Product Name – integer
  - fk_opn_id -> pn_id
- Key to the PR table – integer
  - fk_opr_nfo_id -> pr_nfo_id

PGE Output Table Example (PGE 7.2.1P1)

o_nfo_id	fk_opge_id	fk_ops_var_id	fk_ops_val_id	fk_occ_var_id	fk_occ_val_id	fk_opn_val_id	fk_opr_nfo_id
4	72	15	10	30	13	15	1
5	0	15	10	30	13	21	1
6	0	15	10	30	13	22	1

Queried data

```
SELECT o_nfo_id, pge_num, ps_var, ps_value, cc_var, cc, product_name, fk_opr_nfo_id FROM pr_nfo, pges, output_nfo, ps_vars, ps_values, cc_vars,
cc_values, pn_values WHERE fk_opr_nfo_id = pr_nfo_id and fk_ops_var_id = ps_var_id and fk_ops_val_id = ps_val_id and fk_occ_var_id = cc_var_id and
fk_occ_val_id = cc_val_id and fk_opn_val_id = pn_val_id and fk_opge_id=pge_id;
```

o_nfo_id	pge_num	ps_var	ps_value	cc_var	cc	product_name	fk_opr_nfo_id
4	8.1P1	PS7_2	Edition2C	CC7_2	004007	SYNI	1
5	N/A	PS7_2	Edition2C	CC7_2	004007	SYNS	1
6	N/A	PS7_2	Edition2C	CC7_2	004007	KQCR	1

Catalog Value Tables

- PGEs – pges
- Product names - pn_values
- CC values - cc_values
- Production Strategy values - ps_values
- Sampling Strategy values – sst_values

PGE Table (pges)

Field	Type	Length	unsigned	zerofill	binary	Null	Key	Default	Extra
pge_id	smallint	6	☑	☐	☐	NO	PRI	NULL	auto_increment
pge_num	varchar	15	☐	☐	☐	YES		0	None
pge_status	tinyint	1	☐	☐	☐	YES		1	None

EXAMPLE

pge_id	pge_num	pge_status
0	N/A	0
1	1.0P2	1
2	1.1P1	1
3	1.1P2	0

Product Name Table (pn_values)

Field	Type	Length	unsigned	zerofill	binary	Null	Key	Default	Extra
pn_val_id	smallint	6	☑	☐	☐	NO	PRI	NULL	auto_increment
product_name	varchar	30	☐	☐	☐	YES		NULL	None

EXAMPLE

pn_val_id	product_name
1	BDS
2	ES8
3	ES4
4	ES9
5	EICE
6	ESNOW

Production Strategy Table (ps_values)

Field	Type	Length	unsigned	zerofill	binary	Null	Key	Default	Extra
ps_val_id	smallint	6	☑	☐	☐	NO	PRI	NULL	auto_increment
ps_value	varchar	30	☐	☐	☐	YES		NULL	None

EXAMPLE

ps_val_id	ps_value
1	Baseline1_QC
2	Edition1-CV
3	Ed1-CV-NoSW
4	Edition2
5	Ed2-NoSW
6	Edition2A
7	Ed2A_NoSW

CC Table (cc_values)

Field	Type	Length	unsigned	zerofill	binary	Null	Key	Default	Extra
cc_val_id	int	11	☑	☐	☐	NO	PRI	NULL	auto_increment
cc	varchar	6	☐	☐	☐	YES		000000	None

EXAMPLE

cc_val_id	cc
1	034038
2	026031
3	024032
4	021023
5	022029
6	023031
7	034040
8	027033
9	020030

Catalog Variable Tables

- Production Strategy variables - ps_var
- CC variables - cc_var

Production Strategy Variable Table (ps_vars)

Field	Type	Length	unsigned	zerofill	binary	Null	Key	Default	Extra
ps_var_id	smallint	6	☑	☐	☐	NO	PRI	NULL	auto_increment
ps_var	varchar	15	☐	☐	☐	YES		PS	None

EXAMPLE

ps_var_id	ps_var
1	PS1
2	PS1_1
3	PS2
4	PS2_1
5	PS3

CC Variable Table (cc_vars)

Field	Type	Length	unsigned	zerofill	binary	Null	Key	Default	Extra
cc_var_id	smallint	6	☑	☐	☐	NO	PRI	NULL	auto_increment
cc_var	varchar	10	☐	☐	☐	YES		CC	None

EXAMPLE

cc_var_id	cc_var
1	CC1
2	CC1_2
3	CC1_3
4	CC1_4
5	CC1_5
6	CC2
7	CC2_1
8	CC2_4