

The Regulatory Authority Information System

RAIS 3.1 WEB

Administrator's Guide

Part II

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1 Introduction

1.1 Background

Within its statutory functions in providing for the application of Safety Standards, the International Atomic Energy Agency (IAEA) has been developing the Regulatory Authority Information System (RAIS) as part of a supporting set of actions designed to assist countries in managing their regulatory control programme in accordance with international standards and guidance, including the Code of Conduct on the Safety and Security of Radioactive Sources and supplementary Guidance.

RAIS promotes a consistent and common approach to the regulatory control of radiation sources, whilst offering flexibility to respond to specific needs of the countries, with due account of their national legislative framework, administrative structure and institutional and regulatory framework.

The previous version, RAIS 3.0, has been issued in 2004 in MS Access environment. In 2006, it was extended for implementation on SQL Servers. As of the date of this document, this version is in use, to varying degrees, in more than 63 countries.

The current version, RAIS 3.1 Web, is the most recent product in RAIS evolution series. It provides a web interface for RAIS 3.0 and incorporates additional features and enhancements. Compatibility with RAIS 3.0 is maintained. The reader is advised to refer to *RAIS 3.1 Web Regulatory Model* for a general description.

RAIS 3.1 Web is distributed with a full set of documentation. The installation package of RAIS 3.1 Web contains following documents:

- 1 ***RAIS 3.1 Web Regulatory Model:*** This document describes the underlying regulatory model and addresses its customizability so as to satisfy different countries. This document has a pure regulatory character with no technical details.
- 2 ***RAIS 3.1 Web Administrator's Guide:*** A technical document describing the complete installation process of RAIS 3.1 Web, the process of customizing it to each country's needs.
- 3 ***RAIS 3.1 Web User's Guide:*** A technical and regulatory document explaining the day-to-day work with RAIS 3.1 Web. It also contains tips for good practice and for resolving some typical regulatory situations in form of *How to's*.

1.2 Objectives

This document is the second part of the RAIS 3.1 Web Administrator's Guide. It provides RAIS Administrators with additional information on customization of RAIS 3.1 Web, including technical details related to database structure, query design and assignment to interface functionalities.

1.3 Scope

This document covers:

- Technical insight in the database structure
- Naming conventions in RAIS 3.1 Web
- Customization of protectors and evaluators
- Customizing the various uses of queries in RAIS 3.1 Web

1.4 Structure

Chapter 2 of this document provides technical details related to the naming convention, tables, fields and masks.

Chapter 3 explains the concept of protectors and evaluators and how to customize them.

Chapter 4 addresses the various uses of queries in RAIS 3.1 Web and provides examples for query customization in RAIS 3.1 Web.

The Annex contains a set of diagrams related to the data table structure. These diagrams are essential for understanding the data table structures and building queries

1.5 Pre-requisite

This document is addressing RAIS administrators. With regard to the particular importance of their duties, RAIS administrators are supposed to be familiar with:

- The national regulatory system.
- RAIS 3.1 Web regulatory model. RAIS Administrators are advised to refer to *RAIS 3.1 Web Regulatory Model* for details.
- RAIS 3.1 Web interface. Detailed description is provided in section 2.2 of *RAIS 3.1 Web User's Guide*.
- The concept and mechanisms of customization in RAIS 3.1 Web. Details are provided in *RAIS 3.1 Web Administrator's Guide – Part I*.

Additionally, it would be highly advantageous for RAIS administrators to be familiar with Relational Databases and SQL language, in particular, *Microsoft SQL server 2005*[®].

2 Technical Details

2.1 Features of RAIS database model

RAIS 3.1 Web database model includes following special relationship structures:

1. **Multiple (Double) path structure:** as, for example, in the following figure:

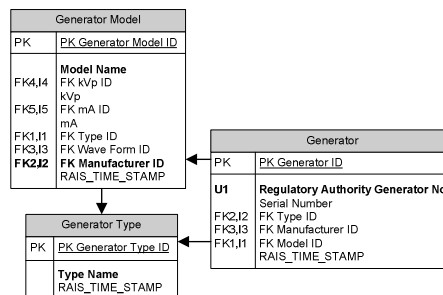


Figure 1. Example of double path between the table [Generator] and [Generator Type]

This structure allows for example to enter generator model, or generator type or both while correctly preserving their relationship. This feature contributes to the “rationality attribute” of RAIS 3.1 Web, i.e. the ability of dealing with incomplete data. See section 2.2 of *RAIS 3.1 Web regulatory Model*.

2. **Junction tables:** as in the following figure

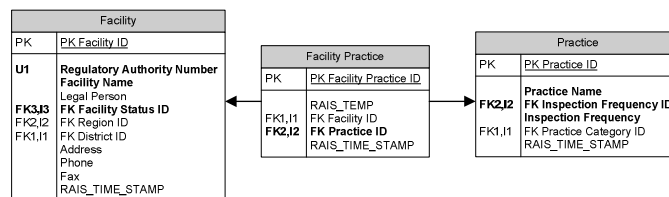


Figure 2. Example of a junction table

Those tables provide for n-n relationships and correspond at the mask level to multiple selection fields. In RAIS 3.1 Web, those fields are called “multiple lookup” fields.

3. **“Details” vs. “Status” data:** For many information items, e.g. sources, authorizations, inspections and workers, RAIS database model make a differentiation between data which are fixed attributes of the item itself, such as serial number or type, and data which change with time and are rather attributed to the status of the item in its workplace as for example source status or the stage of the authorization process. The former are “static” data called *Details* and are stored in tables with no date reference while the later are “dynamic” data called *Status* and are stored in “History tables”.

Note that multiple history tables may exist for the same information item. This is the case, for example, for sealed sources. They have two history tables: [sealed history] and [sealed asso history].

4. **Authorization Type defining Tables:** are defined by relationship from the authorization table to a type-defining table. Should authorization type specific data be necessary, then they are embedded in the particular type defining table. This is the case, for example, for import, export, transport and transfer authorizations.
5. **Dynamic structure:** RAIS 3.1 Web is a dynamic system. Its interface is dynamically structured based on information stored in *RAIS system tables* in the database. This is an important feature to ensure customizability of the system which enables the using countries to adapt it to their national regulatory systems. Sections 2.3 and 2.4 and chapter 4 provide more details.

2.2 Naming Conventions

RAIS 3.1 Web follows some naming conventions for table fields and queries. Some of them are created automatically by RAIS 3.1 Web itself and some are purely optional but are highly recommended to maintain an organized and understandable system.

2.2.1 Primary keys

Primary keys are generated automatically upon creation of tables; they always are the first field of tables within RAIS. All primary keys are integers (32 bit), have an auto-increment of 1, are mandatory (not nullable) and unique within the table. All types of RAIS Tables only have one, simple primary key. All relations between tables are based on primary keys, i.e. primary key values are used as foreign key values in other tables. All primary key names comply with the following naming convention in table definitions¹:

PK & [table name] & ID

2.2.2 Foreign Keys

Foreign keys contain the value of the primary key of a record in another table (referred to as foreign table). As all primary keys are integer (32 bit), foreign keys also are integer values (32 bit). Foreign keys may be either optional (nullable) or mandatory (non nullable). The following naming convention is used within RAIS for all foreign keys:

FK & [foreign table name] & ID

If the table has 2 fields, which refer to the same source table, then such naming convention would create an ambiguity. This is why in such case the field's names will be composed as: "FK" & [field name] & "ID".

RAIS 3.1 Web permits tables to have two or more foreign keys referring to the same source table. In such an exceptional case, the foreign key names will be:

"FK " & [field1 name] & " ID" and "FK " & [field2 name] & " ID"

¹ Throughout this document, object names (as a string) will be represented symbolically in brackets like [object name].

2.2.3 Single Lookup Fields

Single lookup fields allow for selecting an existing record from a related table. They are implicitly foreign keys.

When adding a single lookup field to a table, RAIS 3.1 Web uses following naming convention for the physical field name in the database

FK & [foreign table name] & ID

Important note

Being a foreign key, single lookup fields follow the naming convention used within RAIS 3.1 Web for all foreign keys as described in 2.2.2. It is advisable to ensure that the name of a single lookup field is identical to the name of the foreign table it refers to.

2.2.4 Protectors and Evaluators

Protectors and Evaluators are ordinary table with specific structure and specific uses (see chapter 3).

Protectors are used to protect records from a table. They must be named like:

“Protector ” [table name]

Evaluators are used to select records from a table. Their name must bear the prefix:

“Evaluator ”

2.2.5 Junction Tables

Junction table represent n-n relationship between two tables. A junction table will be automatically created by RAIS 3.1 Web when a multiple lookup field is added to [table1]. The name of this table follow strictly the convention:

[table1 name] [table2 name]

2.2.6 Custom Queries

RAIS 3.1 Web provides for creating custom queries for a variety of purposes. Custom Queries may be used for example for populating controls on RAIS 3.1 Web interface, producing reports, examining data consistencies, etc. More details are provided in sections 4.5 and 4.6 of *RAIS 3.1 Web Administrator's Guide – Part I* and chapter 3 of this guide.

Custom Queries should be named as following:.

[Query Type] – [Name]

The query type is a string that indicates the use of the query. For example, the query named “Preselection List - Facility” will be used to populate the preselection list in a *list with filter mask* associated with facilities.

RAIS 3.1 Web includes following Query types:

- Consistency check
- Entry Filter
- Preselection Filter
- Preselection list
- Query
- Statistics
- RAN
- Allocation
- Unallocation

Additionally, there are other query types in RAIS 3.1 Web, which are used within other queries but not directly assigned to interface components/functionalities. Those are:

- Item Selection
- Helper
- Mini display
- Display
- Calculation

Note

Although not obligatory, it is highly recommended to follow this naming convention in order to keep structure and organization in the system.

2.3 Custom tables

Creation of custom tables and custom fields make use of the following RAIS 3.1 Web system tables:

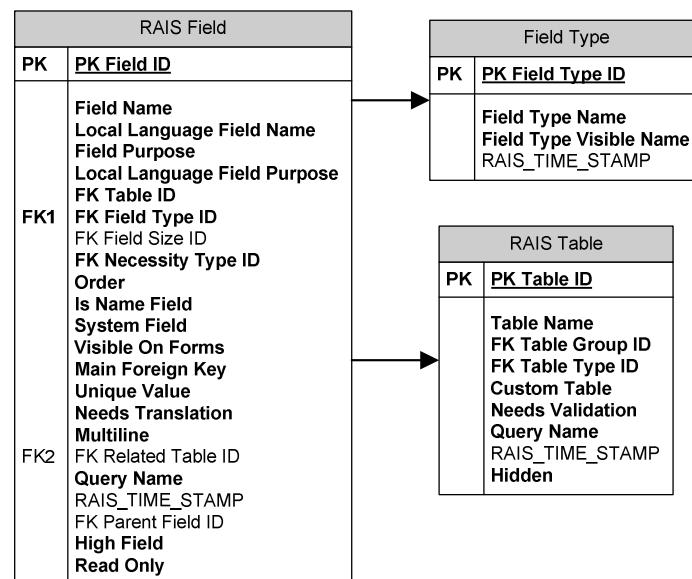


Figure 3. System tables containing definitions of data tables and fields in RAIS 3.1 Web

The table [field type] defines the RAIS 3.1 Web field types, such as “numeric”, “text”, “single lookup”, etc.

If the field [RAIS Field].[FK Field Type ID] is of the type “Single Lookup”, then its values will be taken from the query stored in the field [RAIS Field].[Query Name] if not empty, otherwise from the table referenced to in the field [RAIS Field].[FK Related Table ID].

The field type “Multiple Lookup” is a special case. It corresponds to a junction table in the database between the tables identified by [RAIS Field].[FK Table ID] and [RAIS Field].[FK Related Table ID].

2.4 Dynamic masks

Creating custom masks, e.g. when adding new reports, makes use of the following RAIS 3.1 Web system tables:

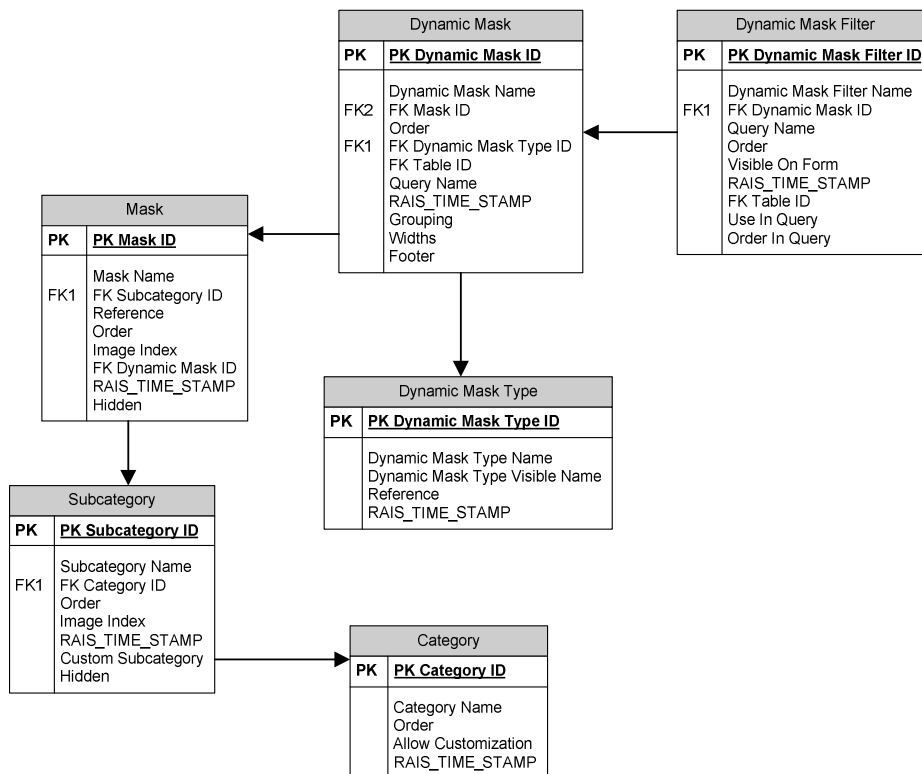


Figure 4. System tables containing definitions of dynamic masks

The tables [Category] and [Subcategory] define in which menu and submenu, respectively, the mask will appear. If the mask is a dynamic mask, then the related attributes, such as its type, are defined in the table [dynamic mask].

Dynamic mask types can be:

- Single row mask
- Single row mask with list
- List with filter mask
- Report mask

For dynamic mask types “Report Mask” and “List With Filter Mask”, a query is associated and identified by [Dynamic Mask].[Query Name]. Parameters of this query are used as filters on the mask.

If the dynamic mask is to contain filters, usually called preselection filters, then those filters are identified in the table [Dynamic Mask Filters]. Parameters of such filters are identified also as filters of the mask.

Example *To add a new report to RAIS 3.1 Web, a dynamic mask will be created. It will be associated to the category “Query” or “Statistics”; its dynamic mask type will be “Report Mask”; the name of the related SQL query will be stored in the field [Dynamic Mask].[Query Name].*

2.5 Implementation of data roles

Data roles provide restriction on accessible data. In RAIS 3.1 Web, data roles provide restriction based on region, district or facility based on the permissions granted to the user. See section 7.3 of *RAIS 3.1 Web Administrator's Guide – Part I*.

RAIS 3.1 Web provides a set of table-valued SQL functions for filtering the data based on the current UserID:

- For regions: ufn_GetAllowedRegionsByUserID (UserID)
- For districts: ufn_GetAllowedDistrictsByUserID (UserID)
- For facilities: ufn_GetAllowedFacilitiesByUserID (UserID)
- For departments: ufn_GetAllowedDepartmentsByUserID (UserID)

The tables returned by these functions contain the allowed set of records and can be used in other queries.

Example *To filter sealed sources by the user, you may use the following SQL statement:*

```
Select [FK Sealed ID] from [Sealed History] sh
INNER JOIN ufn_getallowedFacilitiesByUserID (@UserID) f
ON f.[PK Facility ID] = sh.[FK facility ID];
```

2.6 Class Diagrams

The code of RAIS 3.1 Web has been developed in C# and ASP.Net. The class diagrams can be found on the RAIS 3.1 Web CD under the Directory “RAIS 3.1 Web – Documentation/Class Diagrams”

3 RAIS Advanced Customizations: Tables

3.1 Protectors

RAIS 3.1 Web provides for protection of individual data records from being unintentionally deleted or modified (see section 2.2 of *RAIS 3.1 Web Regulatory Model*).

Example *This mechanism can be used to protect vital data records which are required for proper functioning of RAIS 3.1 Web, or which are related to the national regulatory system*

The protection mechanism ensures that:

- Deletion of protected data records is prevented.
- Modification of protected data records is only permitted after deliberate response to a warning.

Note

The protection mechanism prevents direct deletion of data records; However, it does not prevent cascaded deletion. For example, if a particular department is protected, it can't be deleted directly; but deleting its facility will cause it to be deleted.

The protection mechanism is simply based on creating entries in a protection table which refer (by means of foreign keys) to the data records to be protected. As foreign keys have to be entered for protection, it is clear that a protection table has to be set up for each table containing records to be protected².

The protection table must be named by adding the prefix “Protector ” to the name of the protected table. It has the following structure:

Field name	Explanation	Type	Necessity
PK Protector [protected table name] ID	Primary key (created automatically by RAIS 3.1 Web)		
[protected table name] ^(a)	Foreign key referring Primary key of the record in the table [Generator Type] to be protected	Single lookup	suggested
Deleting Text	Message to be displayed when deletion is attempted	Text	Suggested
Renaming Text	Warning text to be displayed when modification is engaged	text	Suggested
Operation Code	Unused	integer	Not required
RAIS_TIME_STAMP	Created automatically by RAIS		

^(a) this field will have then the physical name FK [protected table name] ID.

² For simplicity, the table containing records to be protected will be referred to as the “*protected table*”

Note

Although the fields [protected table name], Deleting Text and Renaming Text are not mandatory, they are needed de facto:

- *[protected table name] is required for the protection mechanism to be active on specific data records of the protected table.*
- *Deleting Text and Renaming Text may be left blank. The protection mechanism will work displaying a blank message!*

3.1.1 Accessing protectors

RAIS 3.1 Web is set up by default to hide the protectors and related masks from its interface. However, a command associated with the menu item *Show Protectors* in the Tools menu allows for showing or hiding the protectors.

To access the protectors:

1. Click the *Tools* menu
2. Expand the *Tools* submenu
3. Upon clicking the menu item ***Show Protectors***:
 - The protector tables will become accessible through the *Tables* submenu of the *Administration* menu. They are listed under the table group “Common Tables”.
 - Under the *Administration* menu, the submenu, *Protectors*, will become visible. Once expanded, masks to enter, modify and delete entries in the protectors will be accessible
 - The menu item *Show protectors* will be changed into *Hide protectors*

To hide the protectors:

Click the ***Hide Protectors*** menu item under *Tools* submenu. The protector tables will no longer be visible in the table group “*Common Tables*”; the submenu *Protectors* of the Regulatory System menu will be hidden and the menu item *Hide Protectors* will turn into *Show protectors*.

Note

Access to the Show/Hide Protector menu item can be controlled through the functional roles. Among the default user types, this is only granted to the administrator user type.

3.1.2 Adding a new protector

Adding a new protector will be demonstrated in an example, showing how to prevent deletion of particular facilities.

The default installation of RAIS 3.1 Web does not provide for a protector table for facilities. So, in a first step, we have to create this protector table. If the table has already been created in an earlier step, we may of course skip this section and continue.

1. If not visible, show protectors as explained in section 3.1.1

- Following the steps explained in section 4.1 and 4.2 of *RAIS 3.1 Web Administrator's Guide – Part I*, create a single table called “Protector Facility” in the table group “Common Tables” and add the fields *Facility*, *Deleting Text*, *Renaming Text* and *Operation Code*.

be sure to create a dynamic mask for this table and assign it to a menu item under the *Protectors* submenu of the *Regulatory System* menu

- Click the *Regulatory System* menu, expand the submenu *Protectors* and click menu item *Protector Facility*.

The Protector Facility mask appears. The list is initially empty

- Click **Add** and create a new entry referring to the facility to be protected and specifying the deletion and renaming strings. *Operation Code* is not used in RAIS 3.1 Web

Repeat this step, as needed, if you wish to protect other facilities.

After the new protection record has been created, the left side list box displays by default the primary key value of the facility to be protected.

To test that the protection mechanism is working, switch to the *Input/Facility* submenu and navigate to the facility that you have entered in the protector; then try to delete it. A message appears showing the string that you have specified as *Deleting Text* and the deletion action will be aborted.

You may test also the behavior upon modifying the record. A warning message appears displaying the string that you have specified as *Renaming Text*. However, contrary the deletion action, you have the choice to Click **OK** and continue editing; or to click **Cancel** and abort editing.

3.2 Evaluators

Evaluators are tables containing primary key values of special records, or records sharing particular properties, of another table.

Example *The table “Source Status” includes all possible statues, which a source can have. Some of those statuses are related to sources which are outside the country and, hence, can be imported. The evaluator table “Evaluator Import Source” contains references to the primary keys of those records in the “Source Status” table, which represent an importable source.*

Evaluator tables have, beside its primary key which is created automatically by RAIS 3.1 Web, a single field which is a foreign key referring to the tables which contains the records of concern. Having a foreign key, it is clear that an evaluator table has to be set up for each table containing records of concern; and, that a relationship between both tables is defined.

Evaluator tables are used frequently in RAIS 3.1 Web to select (filter) particular records in queries. They provide a convenient and practical way for data filtering, and properly compensate shifting of primary keys.

Example *The primary key of the practice “Dealer/Supplier” in the table “Practice” is 3. The query:*

Select [FK Facility ID] from [Facility Practice] where [FK Practice ID] = 3,

in which this value is hard coded, returns the foreign keys of all facilities acting as dealer or supplier. This query works as long as the practice “Dealer/Supplier” has the primary key value of 3.

A safer and more elegant way is to create an evaluator table, “Evaluator Dealer”, which contains one entry referring to the record of the table “Practice”, which has a primary key value of “3”. Then it is possible to filter the dealers using this evaluator table:

Select [FK Facility ID] from [Facility Practice] in (select [Evaluator Dealer].[FK Practice ID] from [Evaluator Dealer])

3.2.1 Accessing Evaluators

RAIS 3.1 Web is set up by default to hide the evaluators and related masks from its interface. However, a command associated with the menu item *Show Evaluators* in the Tools menu allows for showing or hiding the evaluators.

To access the protectors:

4. Click the Tools menu
5. Expand the Tools submenu
6. Upon clicking the menu item **Show Evaluators**:
 - The protector tables will become accessible through the *Tables* submenu of the *Administration* menu. They are listed under the table group “Common Tables”.
 - Under the *Administration* menu, the submenu, *Evaluators*, will become visible. Once expanded, masks to enter, modify and delete entries in the evaluators will be accessible
 - The menu item *Show Evaluators* will be changed into *Hide Evaluators*

To hide the evaluators:

Click the **Hide Evaluators** menu item under Tools submenu. The evaluator tables will no longer be visible in the table group “Common Tables”; the submenu *Evaluators* of the Regulatory System menu will be hidden and the menu item *Hide Evaluators* will turn into *Show Evaluators*.

Note

Access to the Show/Hide Evaluator menu item can be controlled through the functional roles. Among the default user types, this is only granted to the administrator user type.

3.2.2 Adding a new evaluator

Adding a new evaluator will be demonstrated in an example, showing how specify a particular facility, called “Waste Management Facility”, provided that this facility has been entered into RAIS 3.1 Web.

1. If not visible, show evaluators as explained in section 3.2.1
2. Following the steps explained in section 4.1 and 4.2 of *RAIS 3.1 Web Administrator's Guide – Part I*, create a single table named “Evaluator Waste Management” in the table group “Common Tables” and add a single lookup field named *Facility pointing to the table “Facility”*.

be sure to create a dynamic mask for this table and assign it to a menu item under the *Evaluators* submenu of the *Regulatory System* menu

3. Click the *Regulatory System* menu, expand the submenu *Evaluators* and click menu item *Evaluator Waste Management*.

The Evaluator Waste Management mask appears. The list is initially empty

4. Click **Add** and create a new evaluation record referring to the “Waste Management Facility”, just as if you create any other new record in RAIS.

Note

After the new evaluator record has been created, the left side list box displays by default the primary key value of the Waste Management Facility.

The new evaluator is ready for use in queries such as:

```
Select * from [Facility] where [Facility].[Fk Facility ID] in (select [Evaluator Waste Management].[FK Facility ID]
from [Evaluator Waste Management]),
```

which will return the Waste Management Facility only.

3.3 System Fields

RAIS 3.1 Web includes a mechanism to protect its core structure. In this mechanism, table fields, which are considered vital to the system either from the regulatory or from the technical point of view, may be specified as *System Fields*. This provides an additional defense line which prevents deletion or modification of such fields unless a fully deliberate action is taken by the administrator.

Example *Foreign keys in history tables and unique identifiers, such as Regulatory Authority Numbers, are vital for proper functioning of RAIS 3.1 Web. They shall be defined as System Fields*

Example *The field [Facility name] is a system field because it is considered vital for the proper use and of the table [facility] within the regulatory system, although, technically speaking, it is not necessary from the database structure point of view. Contrarily, the field [phone] is not a system field.*

System field can't be deleted. Editing of all field properties, but the field purpose, is disabled.

If there is an imperative need to edit a system field, an additional step is necessary to declare it as non-system field (see section 3.3.13.3.2) before editing.

Note

Deletion of system fields is prohibited. However, it is possible to declare the field as non-system field and then to delete it. This action should be avoided unless absolutely necessary because it may harm the integrity of RAIS 3.1 Web.

3.3.1 Accessing System Field check box

Declaring a field as a system field is done through a check box on the “*Mange Field*” Mask (see Figure 5), which is hidden by default.

Figure 5. The “*Manage Field*” mask showing the system field check box

To show the system field check box:

1. Click the *Tools* menu
2. Expand the *Tools* submenu
3. Upon clicking the menu item **Show system fields checkbox** and click yes to the warning

To hide the system field check box:

1. Access the *Tools* submenu in the *Tools* menu
2. Click the ***Hide system fields checkbox*** menu item.

Note

Access to the “Show/Hide system fields checkbox” menu item can be controlled through the functional roles. Among the default user types, this is only granted to the administrator user type.

3.3.2 Changing system field property

1. If not visible, show system fields check box as explained in section 3.3.1
2. Following the steps explained in section 4.1 and 4.2 of *RAIS 3.1 Web Administrator's Guide – Part I*, access the table of concern and click ***Edit***.

The “*Manage Field*” mask appears. The *System Field* check box is visible.

3. Select the field that you wish to edit, and click ***Edit***.

If the field of concern is a system field, only the field purpose and the *System Field* check box will be enabled for modification.

To declare such a field as non-system field:

4. Uncheck the *System Field* check box.
5. Click the ***Apply*** button.

The field will no longer be a system field. If you click ***Edit*** again, you will be able to edit its attributes as explained in section 4.2 of *RAIS 3.1 Web Administrator's Guide – Part I*.

Note

After making the desired modifications, be sure to set the System Field property again!

If the field of concern is non-system field, you can make it a system field by simply checking the *System Field* check box and clicking ***Apply***.

Note

Fields that are automatically created by the system in the background, such as primary keys, can not be edited at all. This is to help protecting the system from becoming unstable.

4 RAIS Advanced Customizations: Queries

4.1 General

This chapter describes how to customize features of RAIS 3.1 Web through customization of queries. A step-by-step description of query customization in RAIS 3.1 Web is provided in section 4.5 of *RAIS 3.1 Web Administrator's Guide – part I*.

Customizing queries involves four steps:

1. Customizing SQL statements
2. Setting query parameters
3. Compiling the query
4. Assigning it to some RAIS 3.1 Web functionally

The following table lists the query types that can be created in RAIS 3.1 Web. The query type “Other” encompasses all remaining query types, which can't be directly assigned to interface elements.

Query type	Assignbar to		Possible types of parameters
	Mask type	Element	
Preselection list	List with filter masks	Data List	• date range - end date • date range - start date • lookup from query^(a) • preselected facility • preselected department • User ID
Preselection filter		Data Filters	
Query	Report masks	N/A	
Statistics		N/A	
Entry filter	Single row masks Single row mask with list	Single lookup fields (drop down lists)	• Date • Integer • Lookup^(b) • Primary key • Rational • Text • User ID • XML
Consistency Check		N/A	
RAN auto-generation		non-lookup text fields	
Other			

^(a) Query name is needed for the parameter type “lookup from query”. The parameter “main table for query” must be specified for the cases, where current pre-selection list query is used in the propagation mechanism of preselected values (see section 4.3.3). For other cases this parameter is not required.

^(b) A source field is needed for the lookup parameter.

4.2 Consistency Checks

Consistency checks are regular SQL statements (i.e. queries) executed upon saving records, either new or after editing. A consistency check is considered successful if no records are returned (see section 4.5.4.1.1 of *RAIS 3.1 Web Administrator's Guide – Part I*).

If a consistency check is not successful (i.e. it returns records), a data inconsistency is suspected and an appropriate warning message is displayed. RAIS user has then the choice to cancel saving, or to deliberately ignore it and continue saving the record.

As consistency checks are executed upon saving records, they need to evaluate data which have been entered by the RAIS user into the fields of the current input mask before the record is stored.

In RAIS 3.1 Web database, the table “Consistency Check” controls which consistency checks are to be applied to the input masks and what is the related warning message.

It is possible to execute several consistency checks upon saving a single record. RAIS 3.1 Web will combine the warning messages in one.

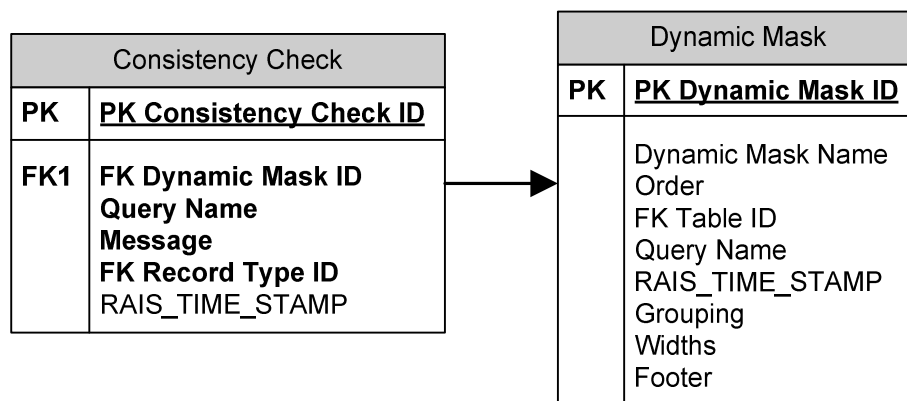


Figure 6. RAIS 3.1 Web table structure related to the consistency checks

4.2.1 Adding a new consistency check

The following simple example demonstrates how to add a new consistency check. The example examines, when a generator records is saved, if the generator type is not defined or has the value [UNKNOWN]. In both cases, the consistency check will return a result. This will be interpreted by RAIS 3.1 Web as potential inconsistency and a warning message will be displayed. This is useful to draw the attention of RAIS user not to leave generator type unspecified!

- Following the steps explained in section 4.5 of *RAIS 3.1 Web Administrator's Guide – part I*, create a new query:
 - Query name: “Consistency Check – Generator Type”.
 - Query type: “Consistency Check”.
 - SQL Statement:

```
select 1 from [Evaluator Unknown GT] where ((@par is null) OR ([FK Generator Type ID]=@par));
```

2. In the parameter tab, specify the properties of the query Parameter “par”:
 - Type: integer
 - Source Field Name: “Type”, which is the name of the radiation generator type field present on the “Radiation Generator Details” mask.
3. Save and compile this query.
4. Following the steps of section 4.6 of *RAIS 3.1 Web Administrator's Guide – Part I*, assign this query as a consistency check to the “Radiation generator details” mask.

To test this consistency check, switch to the menu *Input → Sources and Associated Equipment → Radiation Generator*, and observe what happens when entering or editing radiation generator.

4.3 Preselection Lists and Preselection Filters

Preselection Lists are used to customize the data displayed in the data list of *List with Filter masks*. This type of mask is created by RAIS 3.1 Web upon creating tables. Without customization by a proper preselection list, the data list will be populated by the data records of the related table. The preselection list must always have the primary key of the table as its first field, which will not be visible on the data list.

The “*Preselection List*” of a “*List with Filter*” Mask is stored in the field [Dynamic Mask].[Query]. See Figure 4.

The “*Preselection Filters*” is used to populate the drop down lists on “*List with Filter*” masks. They serve for:

- Filtering lists of records, which are returned after pressing the **Query** button.
- Automatic setting values of corresponding fields when new records are added³. This mechanism is called *Propagation of preselected values*

Generally speaking, “*Preselection Filters*” of a particular “*List with Filter*” mask are determined through the parameters having type “*lookup from query*” of its Preselection List. See subsection 4.3.1.

A preselection filter can take its value from a table or from a query. In the later case, it may be dependent on the values selected in another preselection filter (cascaded filtering).

³ This functionality doesn't apply when editing existing records.

Select Associated Equipment Source Model

Type: Calibration Device

Manufacturer:

Asso Model Name	Type Name	Name
[Unknown]		[Unknown]
10	Calibration Device	J.L. SHEPHERD & ASSOCIATES
100	Calibration Device	ISOMEDIX, Inc.
1000	Calibration Device	INDUSTRIAL REACTOR LABORATORIES, Inc.
1000	Calibration Device	THERMORETEC Corp.
1000 B	Calibration Device	THERMORETEC Corp.
1003A	Calibration Device	GAMMA INDUSTRIES, Inc.
1003M	Calibration Device	GAMMA INDUSTRIES, Inc.
1005	Calibration Device	ATOMERGIE CHEMICALS Corp.
1005A	Calibration Device	GAMMA INDUSTRIES, Inc.
1005M	Calibration Device	GAMMA INDUSTRIES, Inc.

View Add Delete Query

Figure 7. List with Filter Mask. The preselection list populates the data list in the lower part of the mask, while the preselection filters populate the drop-down-lists in the upper part.

Example The preselection list of radiation generators can be filtered by the practice in which the generator is used, its type, the manufacturer and model. The type filter depends on the value of the practice. Similarly, the generator model filter depends on the value of the manufacturer.

In RAIS 3.1 Web database, the mechanism of preselection lists and preselection filters uses the following tables:

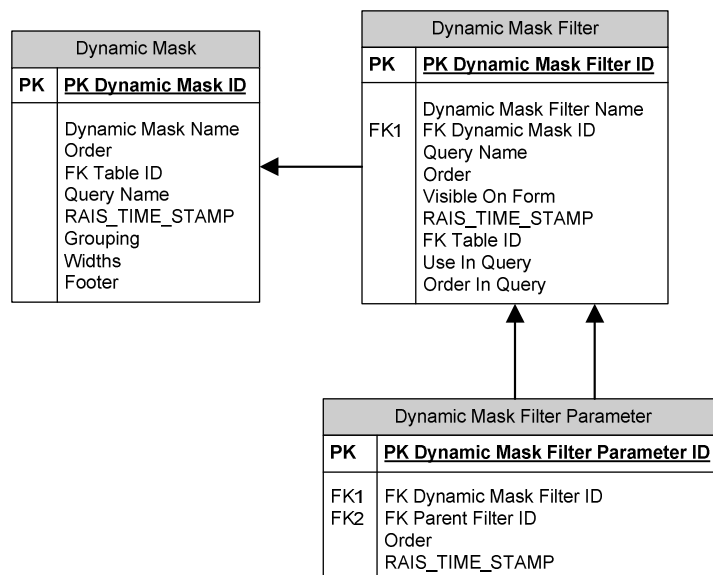


Figure 8. RAIS 3.1 Web table structure related to mask filters

The field [Dynamic Mask Filter].[Dynamic Mask Filter Name] contains the filter name. The drop-down list associated with this filter on the mask is populated by the query referred to in the field [Dynamic Mask Filter].[Query Name].

if not empty, the field [Dynamic Mask Filter].[FK Table ID] is used in the propagation mechanism of preselected values. See section 4.3.3.

Parameters for Preselected Filter are described in the table [Dynamic Mask Filter Parameter]. The field [FK Parent Filter ID] is a reference to the parent parameter, if any.

The following example demonstrates, in the case of sealed sources, how to: (1) customize preselection lists, (2) add preselection filters and (3) propagate preselected values.

4.3.1 Customizing preselection list

The preselection list of sealed sources is the query “Preselection List - Sealed”. This query uses the query [Mini Display – Sealed] to determine the fields to be shown in the list. The mini-display query is, in turn, built up of successive sub-queries.

In this example, the query [Preselection List – Sealed] will be extended to incorporate the sealed source category. Because this example is for demonstration purposes only, and for the sake of simplicity, only the primary key of the sealed source category will be shown. It's left to the reader to figure out how to display the category itself instead of its primary key!

Note

As sub-queries are not directly assigned to any interface element, they can be directly edited, saved and compiled from the query customization menu item

1. Edit the query [Mini Display – Sealed (STAT)], and add the field [Sealed].[FK Sealed Category ID] to the SELECT statement; then save and compile.
2. Edit the query [Mini Display – Sealed (PRE)], and add the field [Mini Display – Sealed (STAT)].[FK Sealed Category ID] to the SELECT statement; then save and compile.
3. Edit the query [Mini Display – Sealed], and add the field [Mini Display – Sealed (PRE)].[FK Sealed Category ID] to the SELECT statement; then save and compile.
4. Un-assign the query [preselection list – sealed] (see section 4.6.5 of *RAIS 3.1 Web Administrator's Guide – Part I*)
5. Edit the query [Preselection List – Sealed], and add the field [Mini Display – Sealed].[FK Sealed Category ID] to the SELECT statement; then save and compile.
6. Assign the query again as a preselection list of the dynamical mask “Select Sealed Source”.

Switch to the menu *Input → Sources and Associated Equipment → Sealed Sources*; and examine the displayed list. The primary key of the sealed source category is shown.

4.3.2 Adding a preselection filter

You need to have completed the steps of subsection 4.3.1 before doing the customization in this subsection.

1. Create a query named [preselection filter – sealed cat]

Select [PK Sealed Category ID], [Category Name] from [Sealed Category];

Note

A preselection filter must have a key field and, at least, another field to be displayed.

2. Un-assign the query [preselection list – sealed] (see section 4.6.5 of *RAIS 3.1 Web Administrator's Guide – Part I*)
3. Edit the query [Preselection List – Sealed], and insert into its SQL statement the following condition, just before the ORDER BY clause

WHERE (((@p)= [Mini Display - Sealed]. [FK Sealed Category ID] Or (@p) Is Null))
--

This condition introduces a new parameter into the query [preselection list - sealed].

4. Switch to the query parameter tab and specify the properties of the new parameter:
 - query parameter type: lookup from query. RAIS 3.1 Web will interpret this type of parameter as a preselection filter.
 - visible name: Category
 - query: preselection filter – sealed cat
 - Main table for query: for the moment leave it blank
5. Save and compile [preselection list – sealed]
6. Following steps described in section 4.6.1 of *RAIS 3.1 Web Administrator's Guide – Part I*, re-assign [preselection list - sealed] to the dynamic mask “select sealed source”

Switch to the menu input → Sources and Associated Equipment → Sealed Sources; and observe the result. A new filter related to the sealed source category will be present. Examine its behavior.

Note

It is not necessary to have the field of a preselection filter displayed in the preselection list, i.e. step no. 5 of subsection 4.3.1, which aims at displaying the sealed source category in the preselection list, is not required for establishing the preselection filter of sealed source category.

4.3.3 Propagating a preselected value

This mechanism is used in RAIS 3.1 Web for the convenience of RAIS user. If a value is preselected in preselection filter on a “List with Filter” mask, and the user clicks **Add** button, RAIS 3.1 Web can use the selected value directly in the appropriate single lookup or multiple lookup fields on the data entry mask.

The mechanism utilizes:

- The parameters of type “lookup from query” associated with preselection list query on the mask.
- The table referred to as “main table for query” in the parameter specifications.

You need to have completed the steps of subsections 4.3.1 and 4.3.2 before doing the customization in this subsection.

4.3.3.1 Propagating preselected value to a single lookup field

1. Un-assign the query [preselection list – sealed]
2. On the query parameters tab, select the parameter “*p*”, and click **Edit**.
3. Select the table “Sealed Category” in the field “*Main Table for query*”
4. Save the query, compile it and re-assign it to the “Select Sealed Source” mask.

Switch to the menu *Input → Sources and Associated Equipment → Sealed Sources*. Select a value in the filter *Category* and click **Add**. The preselected value will be propagated to the sealed details mask

4.3.3.2 Propagating preselected value to a multiple lookup field

The mechanism of the propagating preselected value to a multiple lookup field is the same as propagating preselected value to a single lookup field.

1. Un-assign the query [preselection list – sealed]
2. Repeat similar steps to those explained in subsections 4.3.1 and 4.3.2 and add a preselection filter related to the radionuclide of sealed sources.
3. On the query parameters tab, select the parameter “*p*” related to the radionuclide, and click **Edit**.
4. In the field “*Main Table for query*”, select the table “Nuclide”
5. Save the query, compile it and re-assign it to the “Select Sealed Source” mask.

Switch to the menu *Input → Sources and Associated Equipment → Sealed Sources*. Select a value in the filter *Nuclide* and click **Add**. The preselected value will be propagated to the sealed details mask

4.4 Entry Filters

Entry filters are queries used in RAIS 3.1 Web to customize the contents of single lookup fields and multiple lookup fields on single row masks and list masks.

4.4.1 Populating single lookup fields

In RAIS 3.1 Web terminology, drop down lists are *single look up* fields. When created, RAIS administrator needs to specify the source table, i.e. the table that will be used as a data source for the drop down lists. See section 4.2.1.1 of *RAIS 3.1 Web Administrator's Guide – Part I*. RAIS 3.1 Web will use the first two fields of the source table, i.e. the primary key (which will be hidden in the drop down list) and the second field which be shown in the list.

An entry Filter is a query having the same structure, i.e two fields: a key and a value. It can be associated with a drop down list in RAIS 3.1 Web interface, i.e. a single lookup field, to customize its values. Obviously, the key of the entry filter must refer to the primary key of the source table.

Consider, for example, the query [Entry Filter - Facility]. Its SQL statement looks like:

```
SELECT Facility.[PK Facility ID], [Regulatory Authority Number] + ' (' + [Facility Name] + ')' AS Expr1
FROM ufn_GetAllowedFacilitiesByUserID(@UserID) Facility
ORDER BY [Regulatory Authority Number]
```

This entry filter returns the primary key of facility and a combined string consisting of the facility's RAN and its name in brackets. This entry filter is used to populate many drop down lists in RAIS 3.1 Web interface such as the field [facility] in source or associated equipment status.

4.4.2 Populating multiple lookup fields

When a custom field of multiple lookup type is created in the system, the left list box of the multiple lookup field will be populated with all the rows of the table connected to the field.

In the cases where the rows should be filtered with special condition or the information, which will be shown in the list boxes, should be changed (for example it should be built as a concatenation of values of several field), “Unallocation queries” could be used for the customization of the multiple lookup fields.

Unallocation queries should return at least two fields. The first field must be a key field of the data record. The second field must be a text field that will be visible in the list boxes of the multiple lookup field. These two fields are mandatory. It is possible to change the displayed data by altering the second field, leaving the first field unchanged. The old queries, migrated from the Access RAIS system contains three additional fields: TL, TM, TR. But these fields are obsolete and new Unallocation Queries could be created without them.

Example Consider for example the multiple lookup field “Person” in the table [Authorization]. The related unallocation query is [Unallocation – Authorization Person]. The second field is [Regulatory Authority Number] + ' (' + person.name + ')'. To change the information which will be shown in the listboxes of the Multilookup field, this field should be changed. For example, it can be modified by removing the person name, or including the person's date of birth and so on.

4.5 Reports: Queries and Statistics

It is possible to create custom reports in RAIS 3.1 Web. Reports are created simply by creating a query object in RAIS 3.1 Web database and assigning it to a report menu item (see sections 4.5 and 4.6.2 of *RAIS 3.1 Web Administrator's Guide – Part I*).

RAIS 3.1 Web makes distinction between Query reports and Statistics report based on their accessibility by RAIS users⁴:

- Query reports return detailed information. Access to these reports should be restricted to interested parties, as decided by the regulatory body.

⁴ From the technical point of view, there is no difference between Query and Statistics reports.

- Statistics reports return global information only. Access to these reports might be granted to every body.

The reader is advised to refer to *RAIS 3.1 Web Regulatory Model* and *RAIS 3.1 Web User's Guide* for more details.

The example below demonstrates the creation of a custom query for facilities. A similar approach applies to Statistics reports. It is based on a simple query which returns the name of the facility, the legal person and the region in which it is located. A parameter, “fac”, provides for an optional selection of facility in the report mask. In this case the report will display information related to the selected facility only. If this parameter is left blank, the report will list information related to all facilities.

- Create a new query of type “*Query*” with following properties:

- Name: “*Query Facility*”
- Type: *Query*
- SQL String:

```
Select [Facility Name], [legal person], region.[region name] from [facility] OUTER JOIN [region] ON [facility].[FK region ID] = [region].[PK region ID] WHERE ([PK facility id]=@fac or is null @fac);
```

- On the tab “Custom query parameters” select the parameter Facility, click **Edit** and set the properties of the parameter “fac” as follows:
 - Query parameter type: *Lookup From Query*.
 - Query: *Preselection Filter – Facility*
 - Main table for query: *Facility*
- Save and compile the query
- Following the steps described in section 4.6 of *RAIS 3.1 Web Administrator's Guide – Part I*, assign this query to a menu item under the submenu *Facility* of the menu *Query*
- Click the “*Assign Query*” menu item
- Select Type of customization: *Query Report*
- Click **Add report**.
- Fill up *New menu item* and *Dynamic mask name*.
- Select Custom query name: *Query Facility*
- Click **Apply**

The new report will appear in the menu: *Query* → *Facility Status* → *Facility*

4.6 Regulatory Authority Numbers (RAN)

As described in section 2.5 of *RAIS 3.1 Web regulatory Model*, the regulatory authority number is one of the fundamental concepts in RAIS 3.1 Web. The RAN's are used as human understandable unique identifiers for data items such as facilities, sources, workers, authorizations, etc. Often a unique string containing some information is assigned to data items.

RAIS 3.1 Web offers the possibility to automatically generate RAN's according to algorithms established by the regulatory body. This mechanism is based on implementing the established

algorithm as a *stored procedure*, which will be run upon adding a new record using preselected data.

Note

Automatic generation of RANs in RAIS 3.1 Web is an operation performed PRIOR to creating a new record using preselected data, if any. It will not run after entering the new record's data!

Note

from the technical point of view, RAN Autogeneration queries are stored procedures in RAIS database.

For example, let's assume that the regulatory body assigns to facility a RAN built like:

[region name] & 3-digits sequential number in the region

Such a RAN can be automatically generated by RAIS 3.1 Web upon adding a new facility, provided that the region has been preselected. If no region is pre-selected, then the RAN can't be generated.

1. Create a new query of type *RAN Autogeneration* with following properties:
 - Name: “*RAN Facility I*”
 - Type: *RAN Autogeneration*
 - SQL Statement:

```
DECLARE @ErrorId int, @RowCount int, @trn int
DECLARE @rgn nvarchar(max), DECLARE @s nvarchar(max), DECLARE @sn int

SET NOCOUNT ON

select @trn = @@trancount
if @trn = 0
  BEGIN TRAN

  SELECT @rgn = r.[Region Name]
  FROM [Region] r
  WHERE r.[PK region ID] = @p

  SET @rgn = @rgn + '-'

  SELECT @RowCount = @@ROWCOUNT, @ErrorId = @@ERROR
  IF @RowCount != 1 OR @ErrorId != 0 GOTO _ERR_GET_Region

  SELECT @sn = max(convert(int, right(f.[Regulatory Authority number],3)))
  FROM [Facility] f
  WHERE f.[FK region ID]=@p

  SELECT @ErrorId = @@ERROR
  IF @ErrorId != 0 GOTO _ERR_GET_Sequential

  SET @sn = @sn + 1001
  SET @s = right(convert (nvarchar(max),@sn),3)
```

```

SELECT @rgn + @s
if @trn = 0 COMMIT TRAN

RETURN 0

_ERR_GET_Region:
RAISERROR ('RAN generation error (can not get Region), ErrorCode %d', 16, 1, @ErrorId)
GOTO _ROLLBACK_TRAN
_ERR_GET_Sequential:
RAISERROR ('RAN generation error (can not determine sequential number [%s] ),
ErrorCode %d', 16, 1, @ErrorId)
GOTO _ROLLBACK_TRAN
_ROLLBACK_TRAN:
if @trn = 0 ROLLBACK TRAN

RETURN 1

```

2. On the tab “Custom query parameters” select the parameter Facility, click **Edit** and set the properties of the parameter “p” as follows:
 - Query parameter type: *Lookup From Query*.
 - Query: *Preselection Filter – Facility*
 - Main table for query: *Facility*
3. Save and compile the query
4. Following the steps described in section 4.6 of *RAIS 3.1 Web Administrator's Guide – Part I*, assign this query to a menu item under the submenu Facility of the menu Query

Note

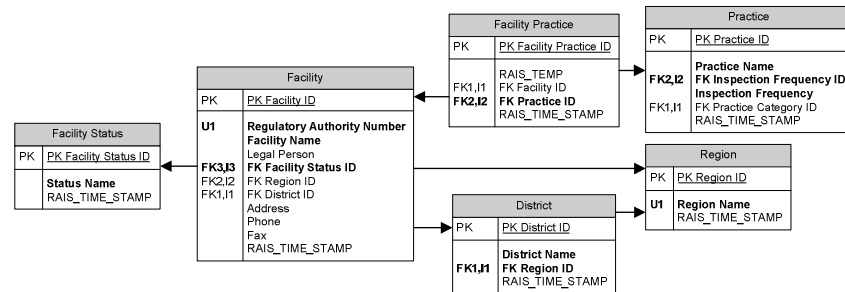
the RAN auto mechanism generation can be used to provide values for any calculated field!

5 ANNEX Entity Relationship Diagrams

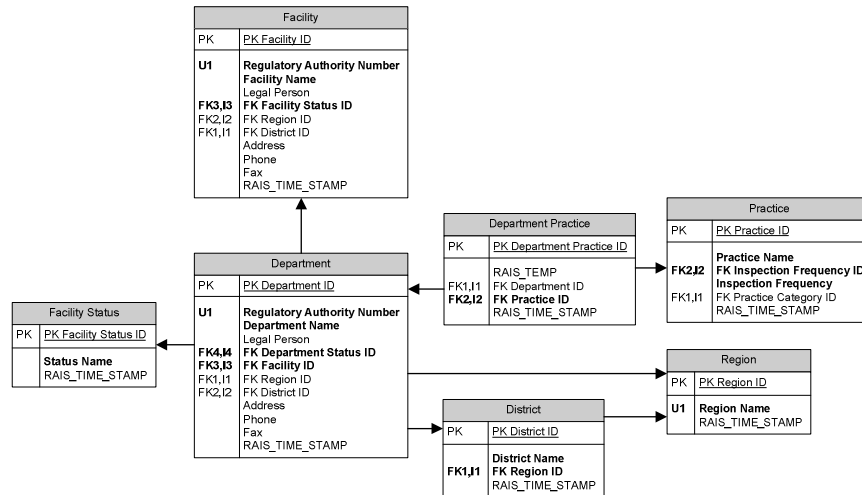
The following Entity-Relationship-Diagrams are based on the database model contained in the original distribution of RAIS 3.1 Web, common to all official IAEA languages. Only the major entities (information items) and their relations are detailed in the following sections. The reader should be aware that these diagrams may vary, depending upon customizations of database tables.

5.1 Facilities and Departments

5.1.1 Facilities

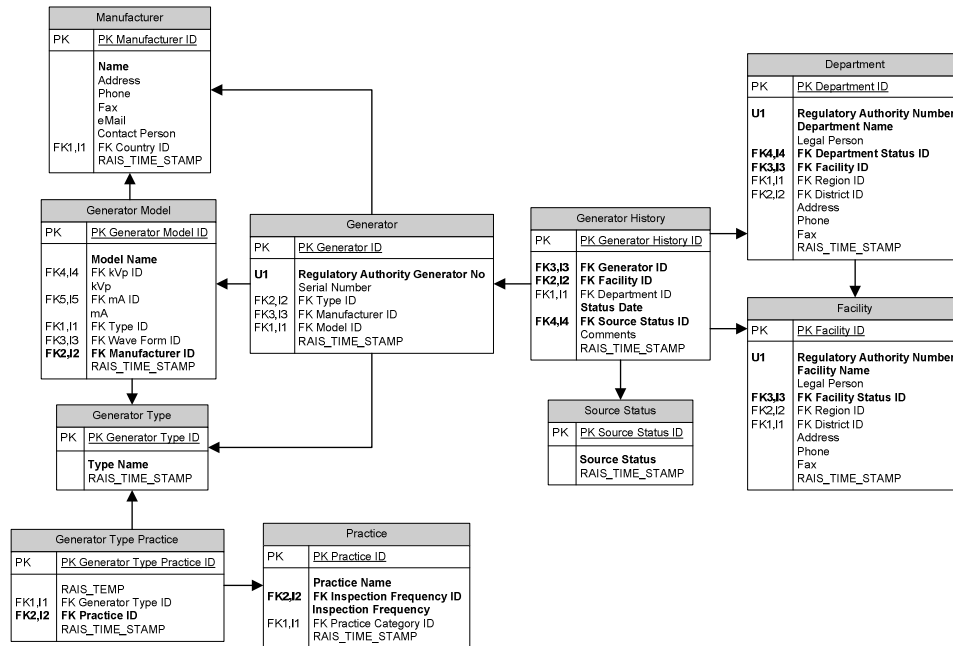


5.1.2 Departments

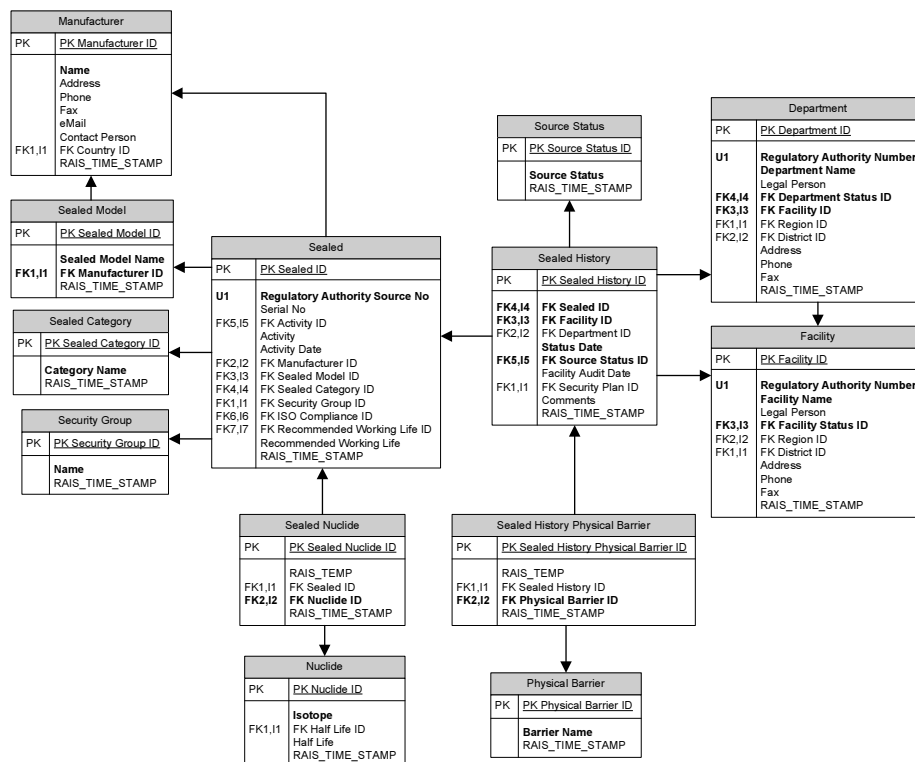


5.2 Sources

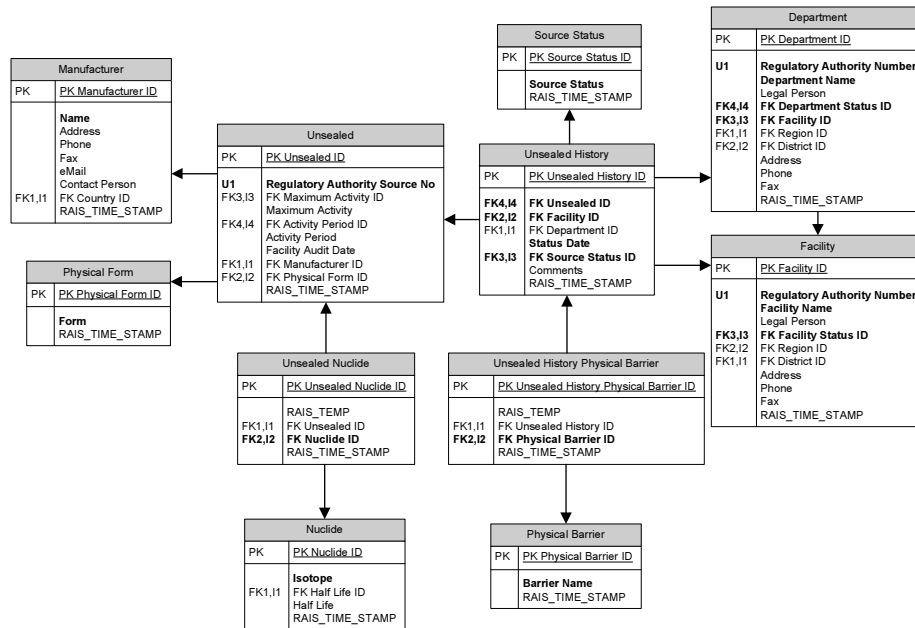
5.2.1 Radiation Generators



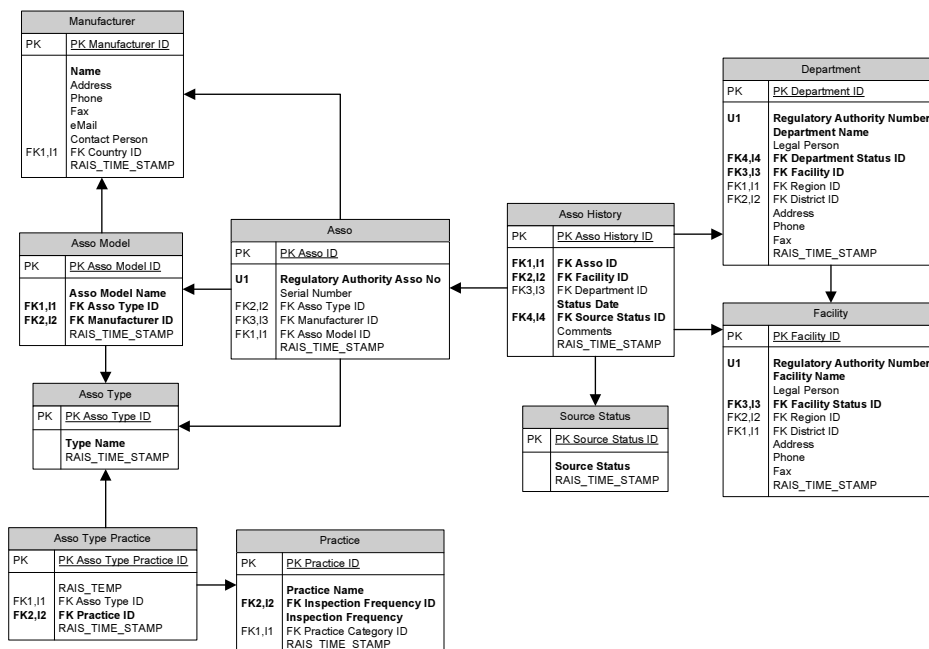
5.2.2 Sealed Sources



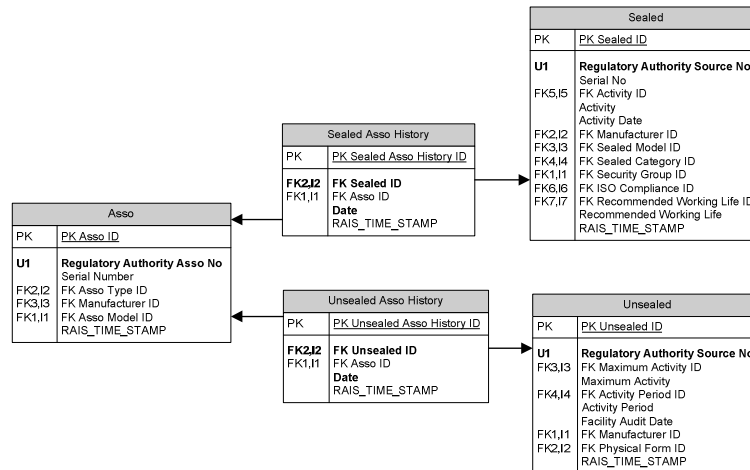
5.2.3 Unsealed Sources



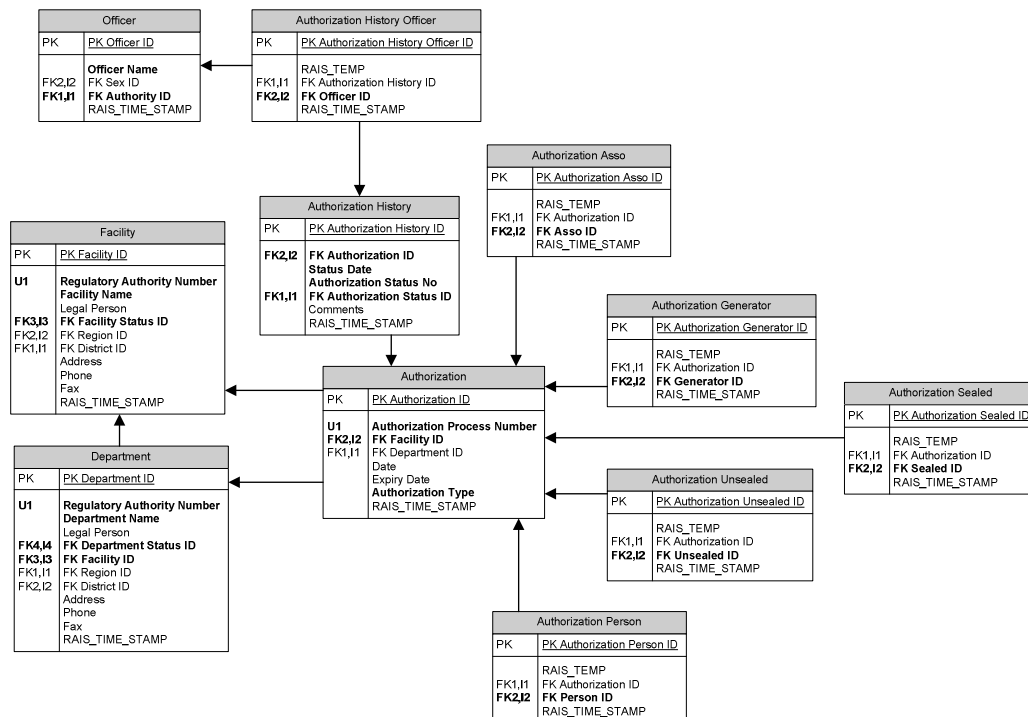
5.2.4 Associated Equipment



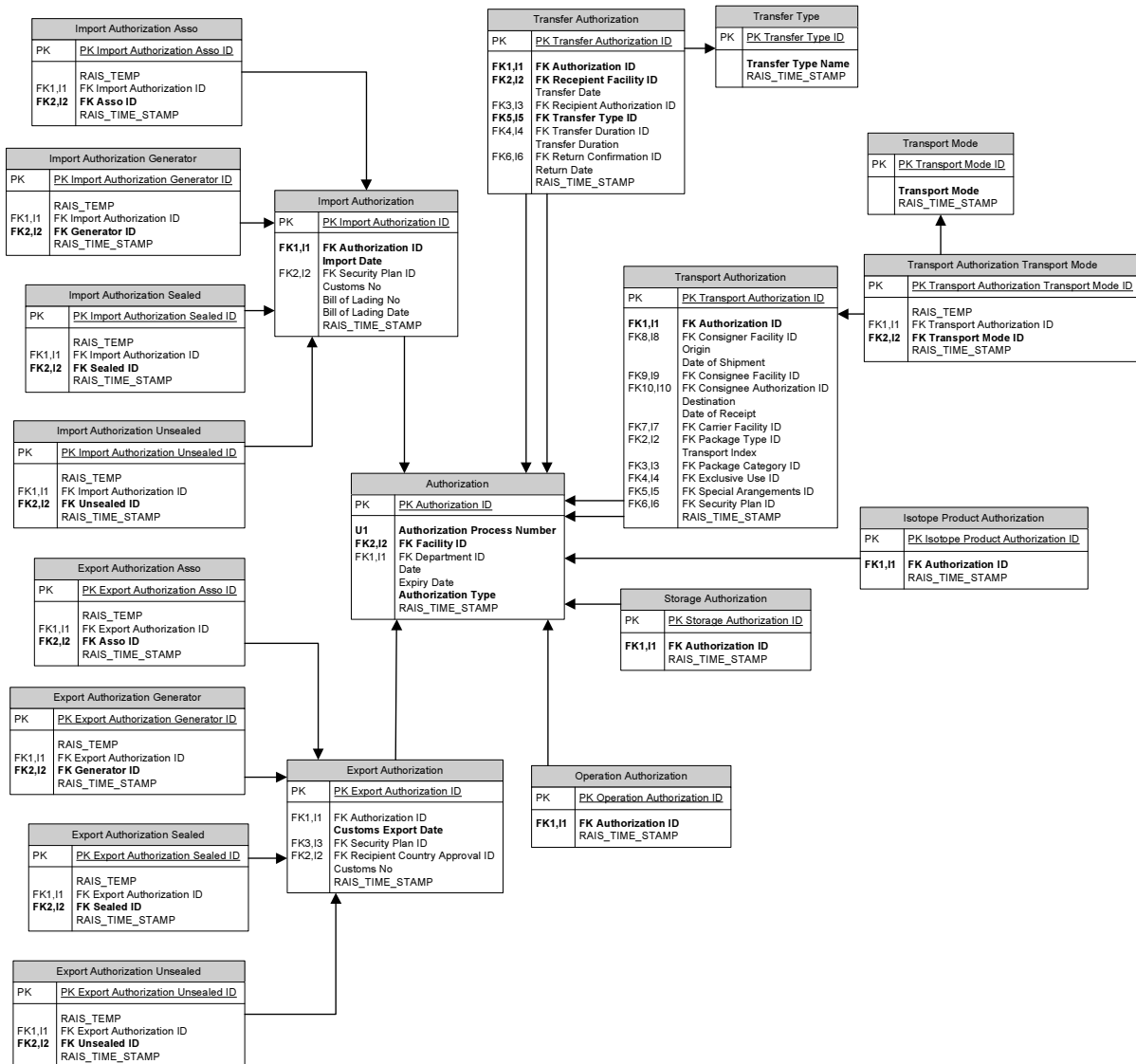
5.2.5 Source-Equipment Association



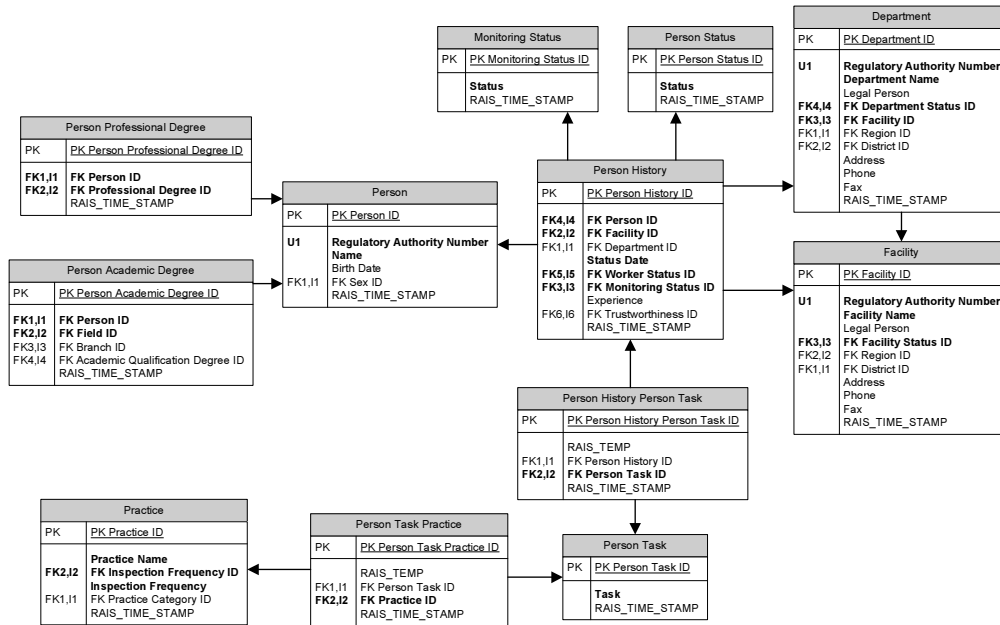
5.3 Authorizations



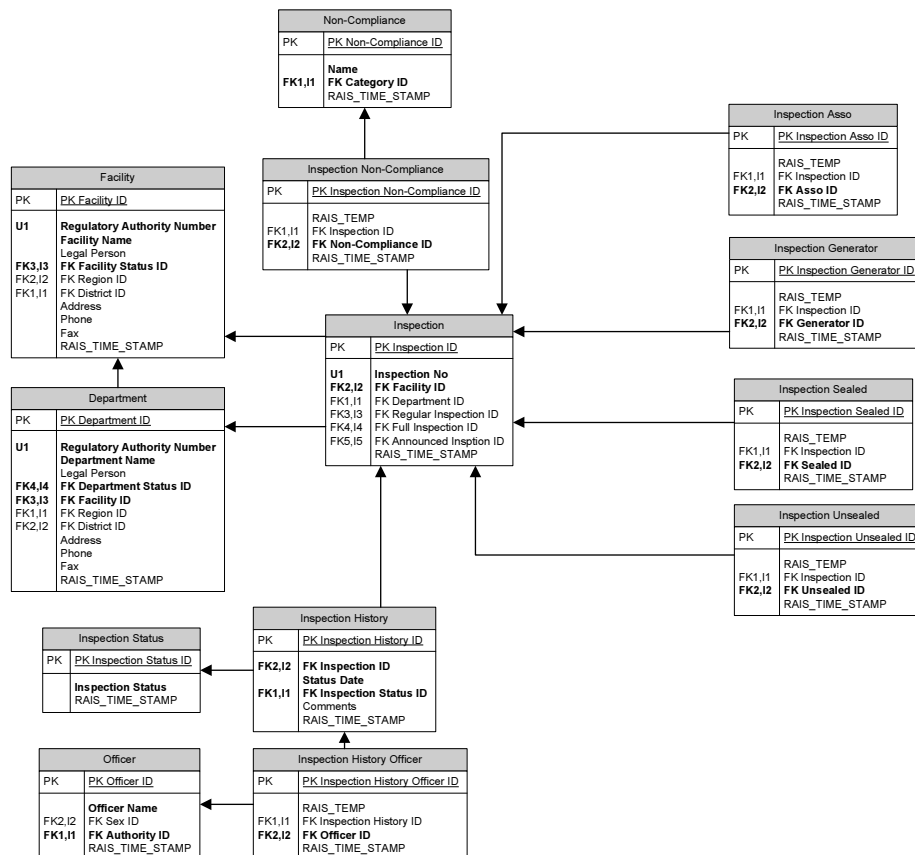
5.3.1 Authorization Types



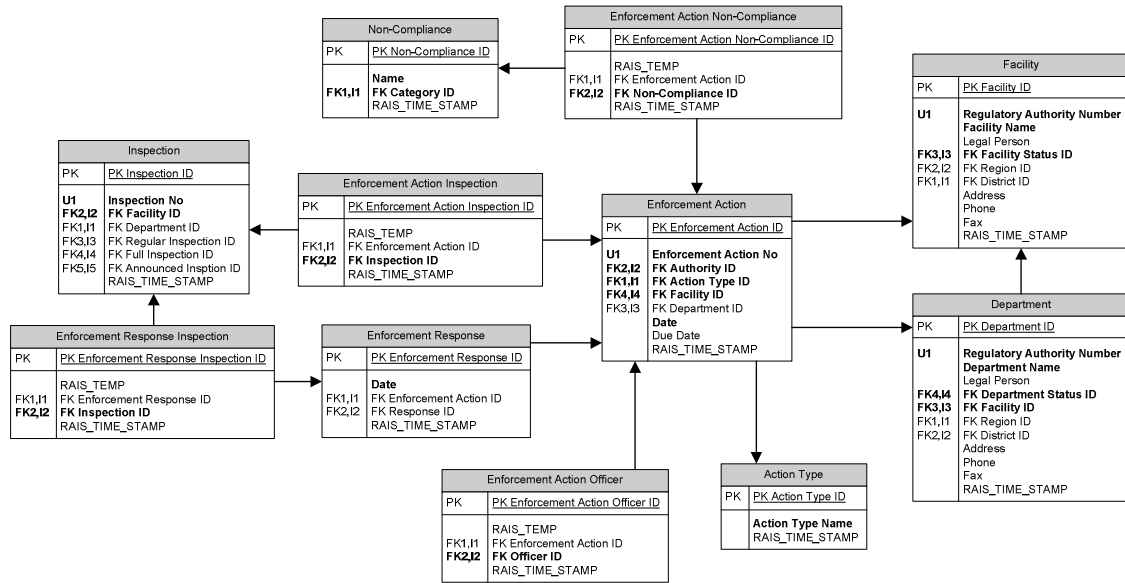
5.4 Workers



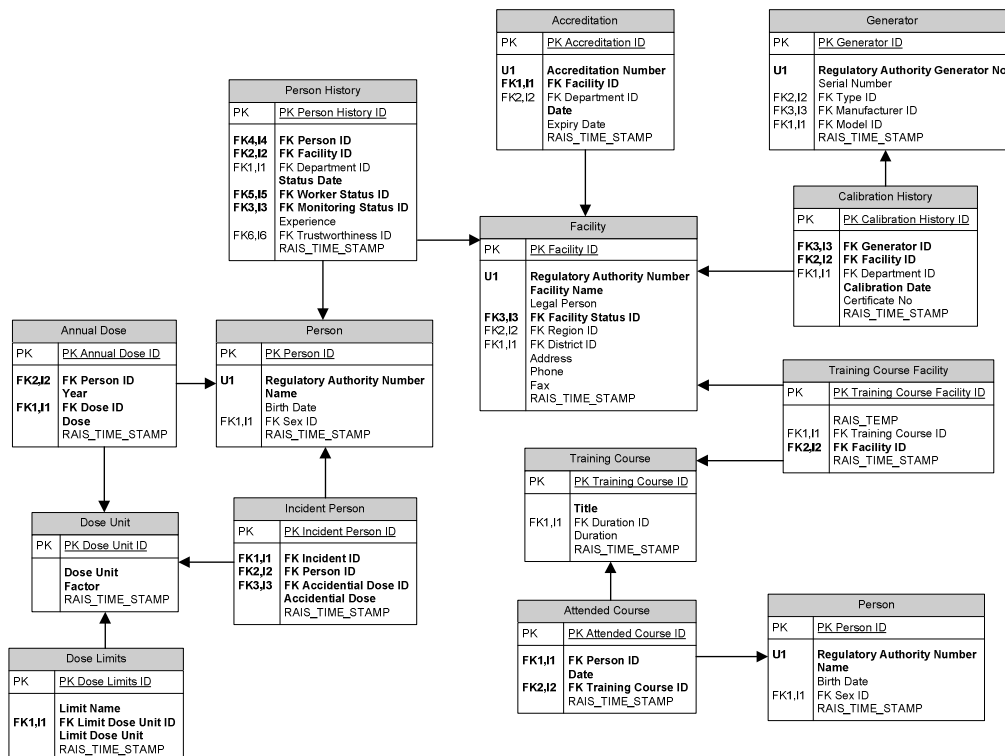
5.5 Inspections



5.6 Enforcements

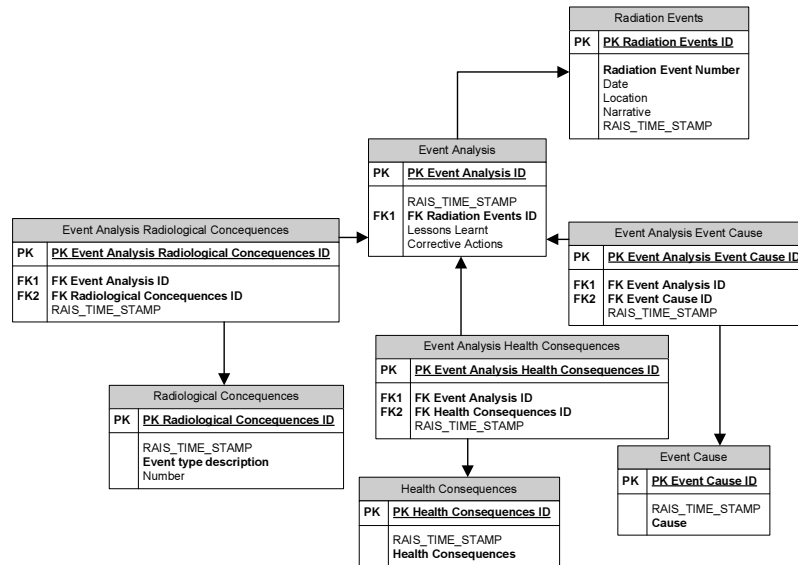


5.7 Service Providers

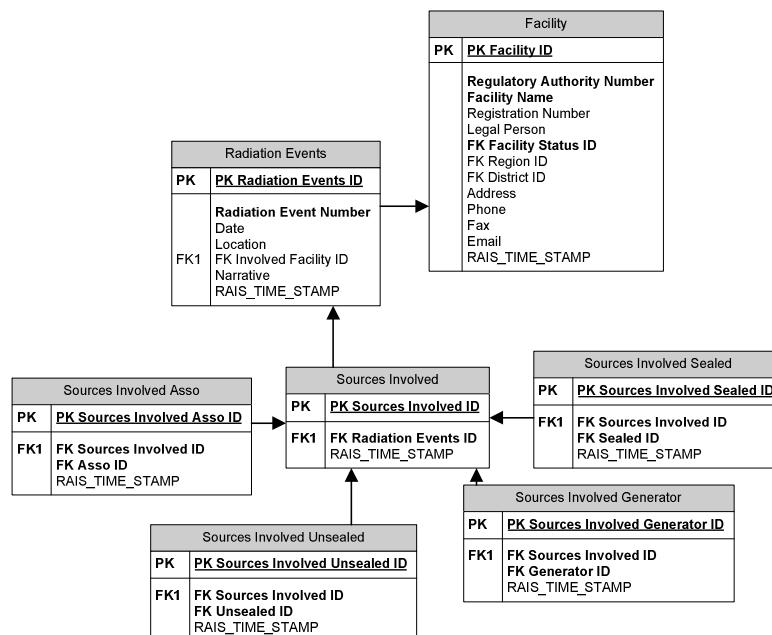


5.8 Radiation Events

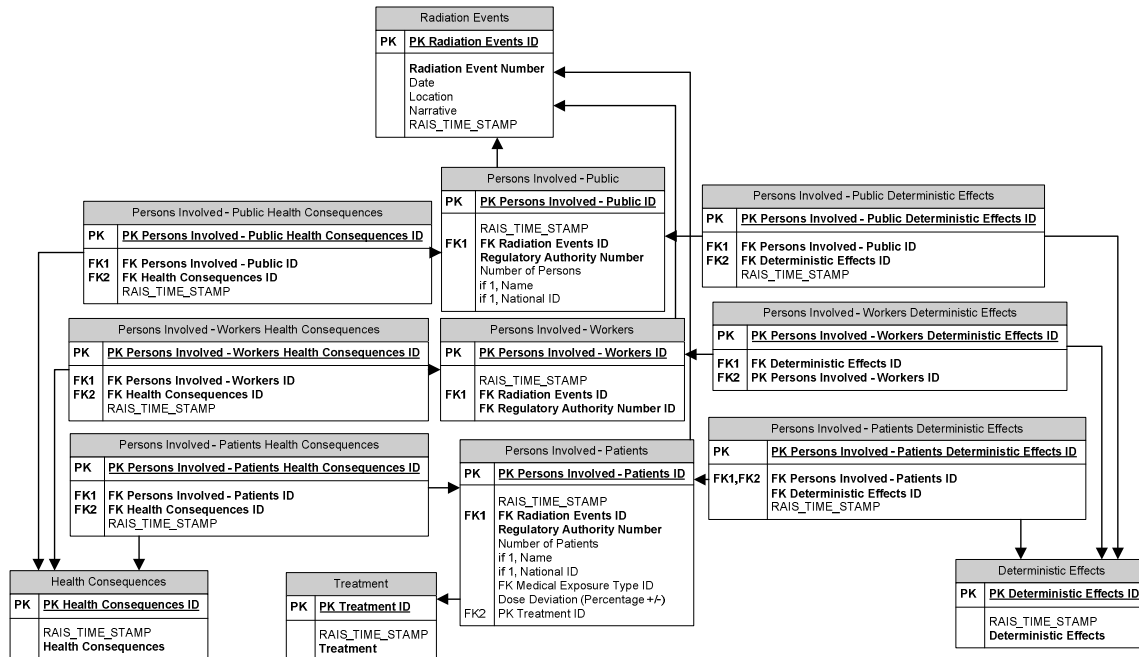
5.8.1 Event Analysis



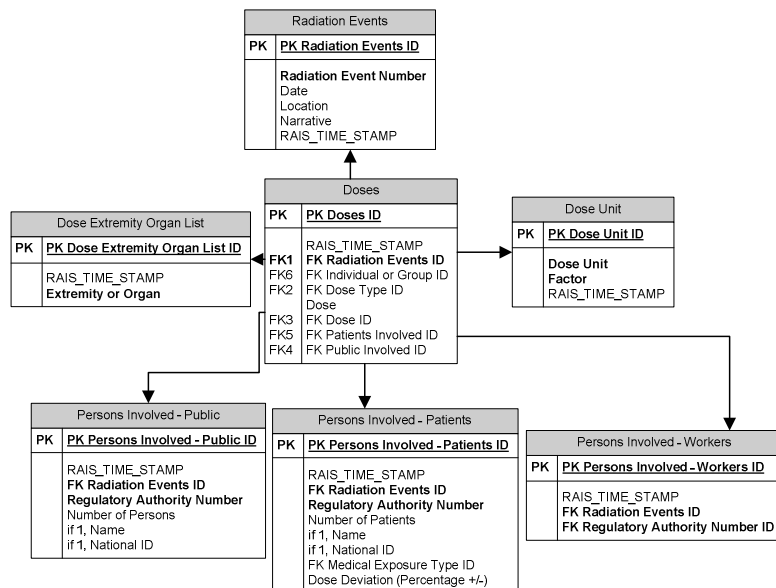
5.8.2 Sources Involved



5.8.3 Persons Involved



5.8.4 Doses



5.8.5 Reporting

