



# NATIONAL DOSE REGISTER

## Project Status

**Alan Muller, NNR**  
**21 April 2015**

# International Basis

GSR Part 3: Requirement 25,  
paragraphs 4.63 and 4.64

- Regulatory Body makes provision for establishing and maintaining records of occupational doses
- The regulatory body may or may not be the sole entity responsible for the maintenance of these registers and inventories,
- Regulatory Body involved in their proper retention and use.
- Authorized parties responsible to keep their own records.

European Union BSS

Results of individual monitoring submitted to a NDR established by each EU Member State

Other Countries establishing and maintaining National  
Dose Register



# National Arrangements

- Currently no explicit legislative requirement for NDR
  - No central registry for the management of occupational radiation doses
  - No real harmonisation of records and reporting systems
  - SSRP requires each authorization holder to have a dose register of exposed workers
  - Draft Regulations for Nuclear Industry
- 
- Joint Cooperative Committee NNR-DOH
  - 2007 meeting with DSP's (host of NDR, legislation)
  - Self Assessment Implementation Action Plan
  - Situational Analysis



# National Regulatory Project

- Joint Cooperative Committee NNR-DOH
- 2007 meeting with DSP's (host of NDR, legislation)
- Self Assessment Implementation Action Plan
- Situational Analysis
  - International practice, available databases, location, RDR
- The proposal for the NDR database accepted by the JCC, NNR Board
- Meeting with DSPs on 29 February 2012



# Benefits of NDR in RSA

- Integrated system of records of occupational doses
- Confidence in record keeping process
- Evaluation of dose trends and statistics
- Reporting purposes, e.g. annual reports, UNSCEAR
- Health research and epidemiological studies
- Providing dose histories to individual workers and organizations for work planning
- Compensation and litigation cases
- Compliance with related dose limits
- Cover all types of external/internal occupational exposures, employers

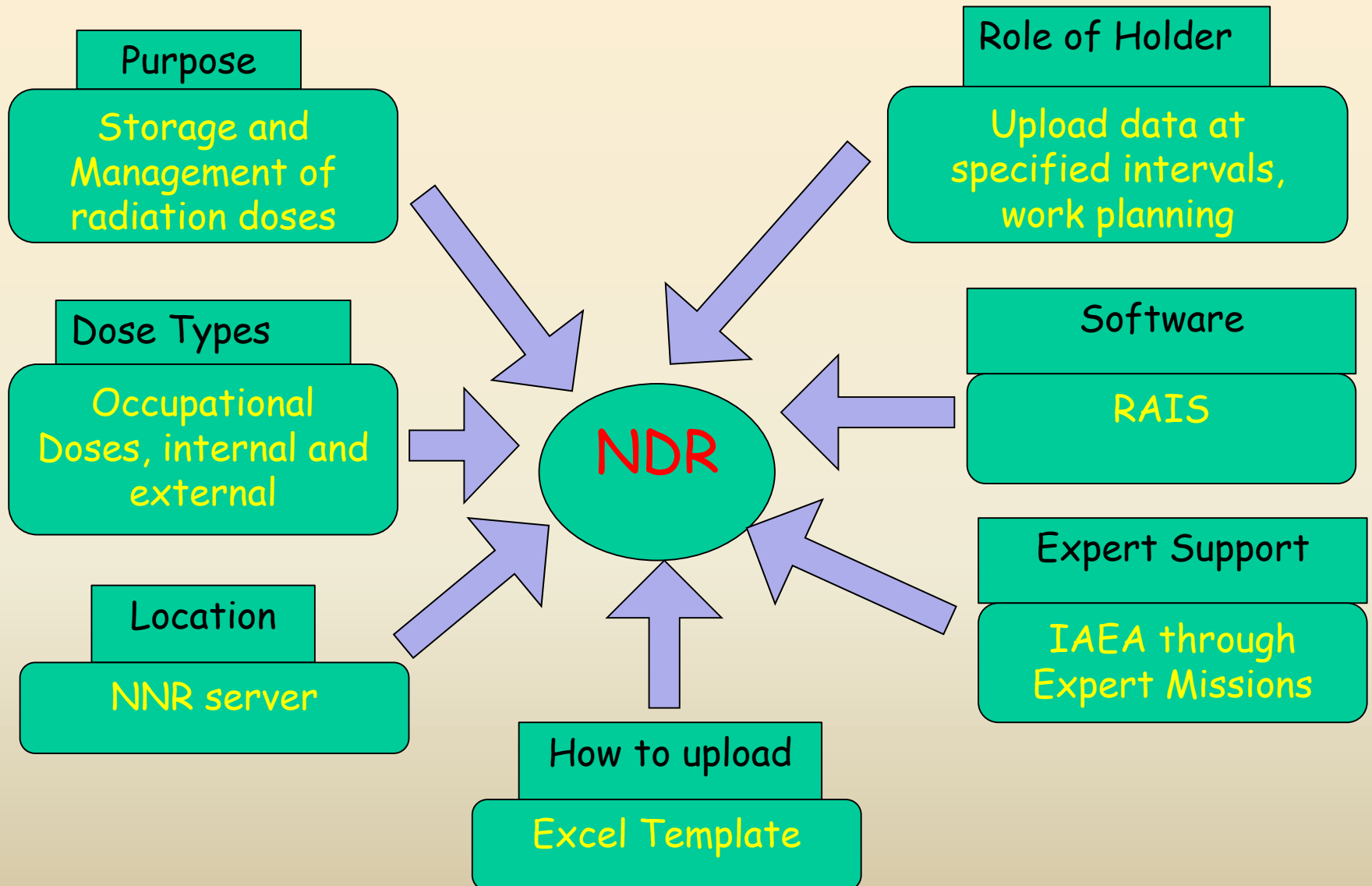


# Steps in establishment of NDR

- Informal discussion with IAEA in 2011 and 2012
- Proposal approved 30 March 2012 by RBs
- Submitted to IAEA on 2 April 2012
- Included in IAEA TC cycle 2014-15
- Steering Committee for NDR
- Design, Customization, Testing and Verification as well as Implementation
- Project Plan



# Background



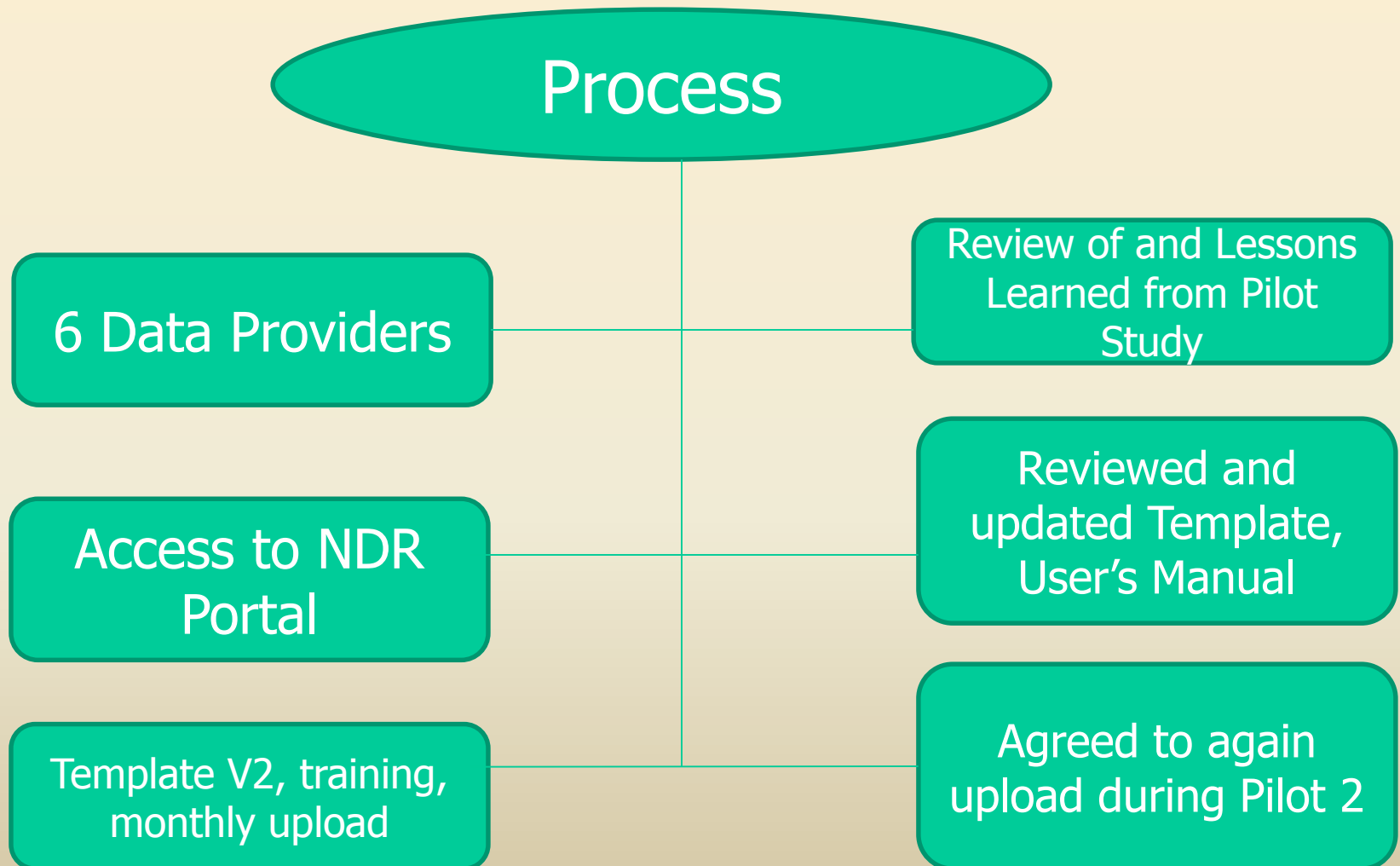
# Management Structure



- Meetings
- Reports
- Letters
- Minutes
- Risk Management
- Training



# Pilot 1



# Mission outcome

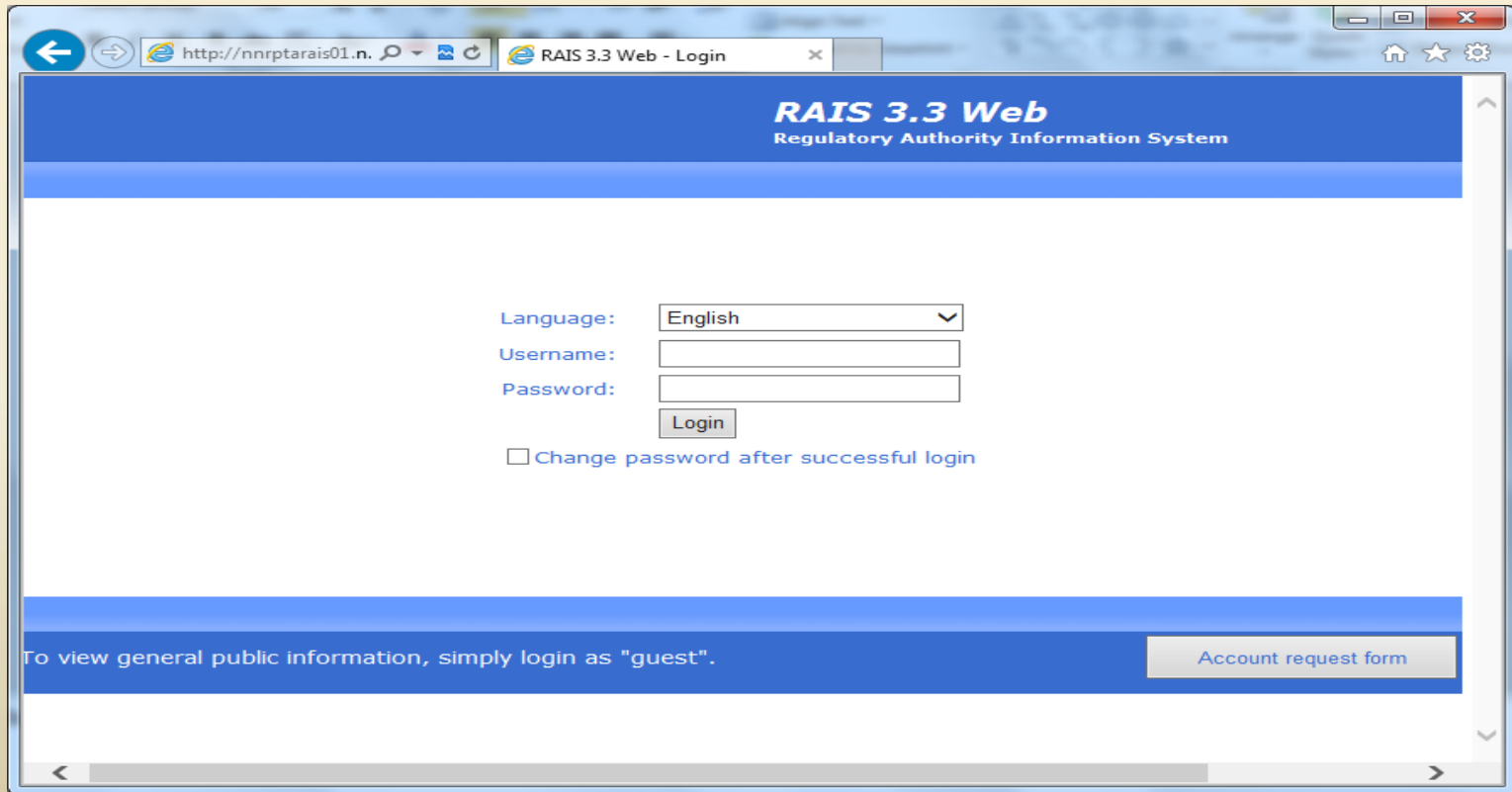
## Overview of duties

- To install the newest version of RAIS, RAIS 3.3, in NNR servers
- To set up the prototype for the NDR and the data transfer mechanism
- To provide training to the relevant people and prepare for the pilot run of the NDR

# Mission outcome

## To install RAIS 3.3 on NNR servers

- Upgrade was successful



# Mission outcome

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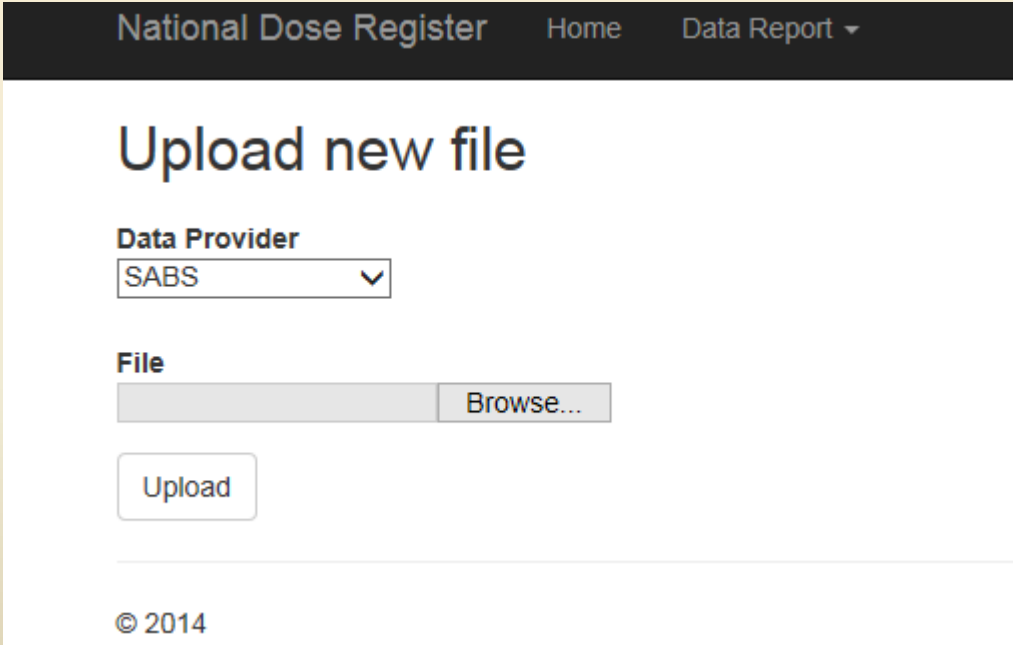
NDR



## Mission outcome

# Setting up NDR prototype and transfer mechanism

- Data upload portal designed



The screenshot shows a web interface for the National Dose Register. At the top, a dark navigation bar contains the text 'National Dose Register', 'Home', and 'Data Report' with a dropdown arrow. Below this, the main heading is 'Upload new file'. Underneath, there is a 'Data Provider' section with a dropdown menu currently set to 'SABS'. The 'File' section features a grey input field and a 'Browse...' button. An 'Upload' button is positioned below the file field. At the bottom left, there is a copyright notice '© 2014'.

National Dose Register Home Data Report ▾

### Upload new file

**Data Provider**  
SABS ▾

**File**  
 Browse...

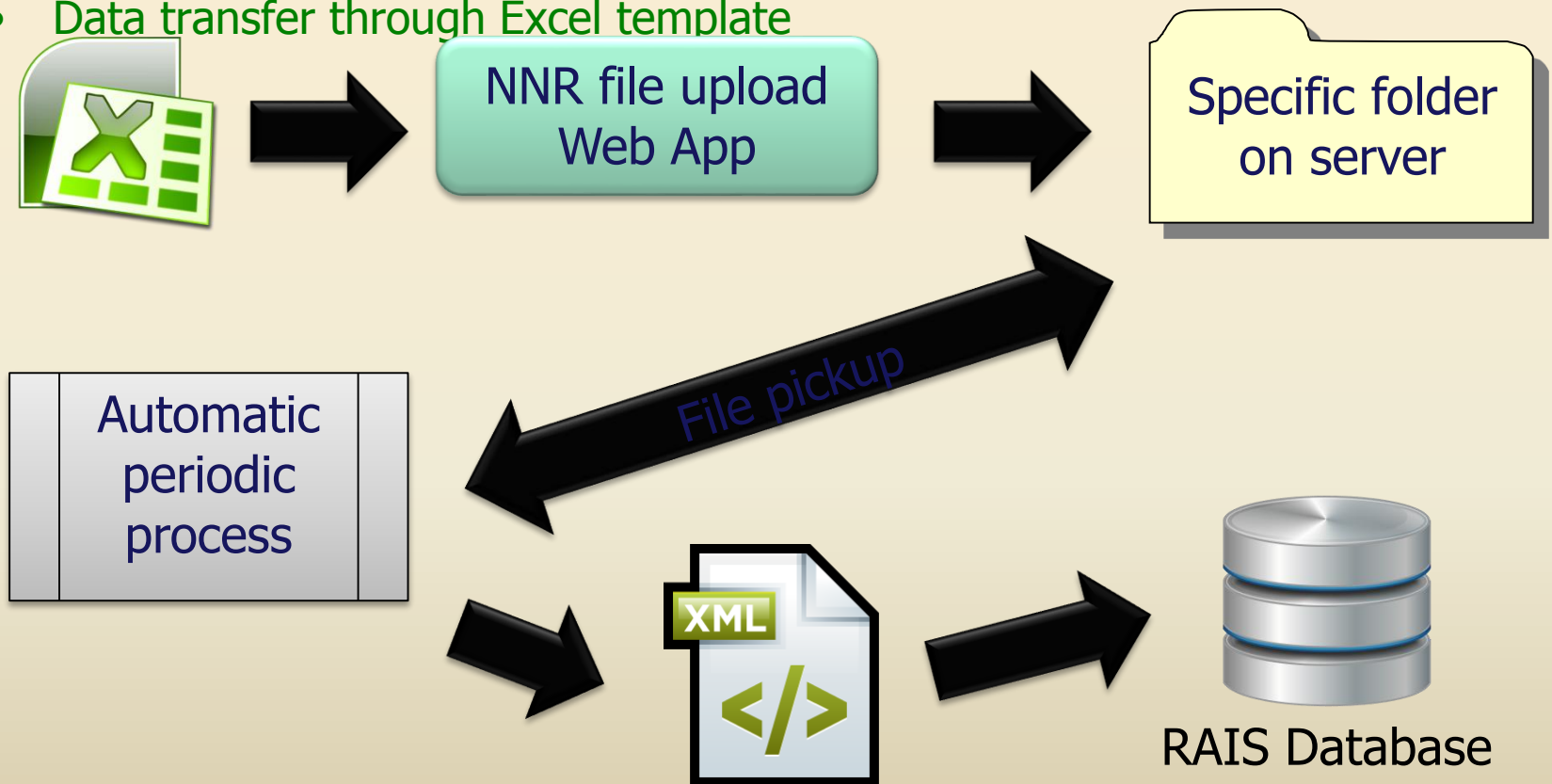
Upload

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© 2014

# Data transfer system structure

- Data transfer through Excel template



# Mission outcome

## Overview of duties

- To install the newest version of RAIS, RAIS 3.3, in NNR servers
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- To provide training to the relevant people and prepare for the pilot run of the NDR

NDR



## Mission outcome

# Providing training and preparing the pilot run

- Training provided on Thursday to
  - RAIS NNR users
  - NNR IT system administrators for first line troubleshooting
  - Data providers (DSPs and NORM license holders)
    - Trained for filling in the template
    - Trained for uploading the data using the upload portal

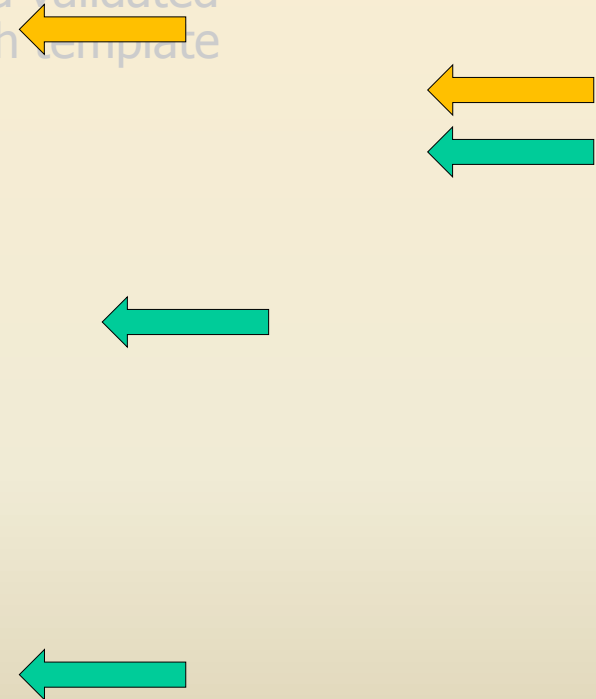
# Mission outcome

## Important considerations

- Template data must be correctly filled in
  - Adhering to the mandatory fields
  - Adhering to the prefixed dropdown values if appropriate
- Performance of the system
  - The system will have a large amount of data to process each month
  - Server memory, processing power and capacity must be scaled for this

# Project phases

- Feasibility study. Conducted in August 2012 under TC project RAF9042
- Phase 1
  - NDR designed and implemented in RAIS
  - Excel template for data exchange designed and validated
  - DSPs providing worker and facility data through template
- Phase 2
  - Data upload module completed
  - DSPs upload sample data using the template
  - Kick-off of the pilot project
- Phase 3
  - Pilot project runs for a few months
  - Issues are identified and fixed
  - Reports implemented as needed
  - Training provided for NDR administrators
  - Official kick-off of the NDR



# Mission#3 Programme Progress

- Opening Meeting 1 Dec 2014
- Meeting with NORM 2 Dec 2014
- Training for NORM on template not conducted
- Proposed Way Forward to NORM
- Reviewed comments on template
- Proposed changes to template
- Proposals for Steering Committee on identified issues from Mission



# Pilot 1 – Review of Uploaded Data

- 6 organisations requested to upload in Pilot
- Some DP's uploaded all files
- Some DP's uploaded some file
- Some DP's uploaded all files in correct formats
- Some DP's uploaded some files in correct format
- One DP did not upload any file
- Show uploaded files and indicate issues



# Data Transfer Template for 2<sup>nd</sup> Pilot

- Finalise before end January 2015
- Comments from Sibanye, Harmony, Necsa
  - Only total dose, other fields separate worksheet
  - Summation for report types
  - Originator type replaced by Template version
  - Add Necsa, Vaalputs, remove NL for Companies Identifiers
  - In guidelines include priority identification order
  - Move Total Dose next to Begin and End dates
  - Mandatory Exposure Type options External, Internal and Total Dose
  - Dosimeter Type in separate sheet (4 types, add TLD, gravimetric sampling)
  - No Individual and Workplace fields
  - Add Corrections in Dose Status (also rename)
  - Practice in company, list from SABS, maintained by NNR and DOH (Users Guide)
  - Replace First Name with Initials (Mandatory), make First Name optional
  - No Template changes after April 2015, consider after 1y
  - Show proposed new template



# User's Manual

- Finalise before end January 2015
- In NNR document format
- Include in Web Portal as link
- Add screenshots of template, Portal
- Comments from Pilot to be included (update after each project milestone)
- Prepare Appendix distinguishing what type of data to be uploaded by each category/DP
- Extremities for holders required (specify in Users Manual)
- DPs will not access RAIS, only Portal (upload and access to records)
- Show User's Manual/comments



# Other NORM DPs

- Finalise template end Jan 15
- 17 NNR letters to Participate in Pilot before end Jan 15
- DPs respond to NNR letter to participate in NDR early Feb 15
- NNR provide usernames, passwords for Portal by email
- NNR forward Template, User's Manual, contact details after letter received by email
- DPs practice upload, filling of template on own during Feb and Mar 15
- If challenges, issues contact Dirk Venter, Thys or Mathieu (provide email addresses)
- NNR-NORM meeting April 15 to discuss NORM issues and Training for NORM DPs on upload/template (remotely)
- Administrator review and feedback on data upload by Mines
- Pilot to upload till end of June 15 (3m), IAEA EM July 15
- Participate in July Mission, if possible historical data upload





# Other NORM DPs

- 17 NORM Data Providers
- Email addresses provided
- Database, output file and fields requested (email)
  - AMIS
  - Taulekoa
  - Evander
  - FOSKOR
  - Tronox
  - ARCONSA
  - Anglo Research
  - Gold Fields-South Deep
  - Zimkile
  - Vesuvuis
  - TPT
  - OMNIA
  - SAPS
  - RAPPA
  - Kabo
  - ALS Minerals
  - SA Metal



# NNR-NORM Meeting

- April 2015 to discuss/confirm NORM issues
  - Frequencies of data uploads
  - Impact of changes in Mine ownership
  - Period of historical data to be uploaded
  - EPD/area monitoring
  - Need for submission of future reports
  - Types of doses to be uploaded by NORM
- Training of NORM on template (after practising)



# Legislation and Standards

- NNR to use as basis report from J le Roux
- Report by NNR end Feb 2015
  - NNA Act Amendments
  - Regulations
  - Gazetting of NDR
  - Regulatory Guide
  - COR additional conditions, directives
- Circulate to Steering Committee and address recommendations



# ICT

- ICT strategy/plan by May 2015 on
  - Configuration and installation of Final NDR Server
  - Backing up of Data
  - Archiving of Data
  - Capacity to store all historical data
  - Security of NDR
  - Full scalable SQL Server
  - Reports and checks to ensure accuracy of data
  - Trained on RAIS, SQL etc.



# Final NDR – Upload of Data

- Directive / COR conditions to upload to Portal
- 1 account per DP
- DP master account rights for subaccounts
- DP responsible for accuracy of uploaded data
- Dose upload to NDR in line with authorisation conditions
- Automatic reminder to upload data (COR frequencies)
- Email to NNR admin (already in system) if new file uploaded
- DPs set up for monthly upload can do so
- DP approved internal reports prior to data upload
- Logos for Portal



# Final NDR – Access to Dose Records

- NDR automated as much as possible, restricted access
- Each DP to have Master account, provides rights to other persons in DP sub-accounts
- DPs responsible/liable for Master and sub-accounts confidentiality, control (internal policy)
- Master decide on types of access by others to reports (update User Manual)
- Dose tracking in form of monthly/quarterly outputs, last 3 months no doses, will have to ask employee
- DP access all workers total doses, for whom they have consent form, NOT names of other companies except own
- In NDR date of consent, signed worker consent form in medical file, consent valid for all DP accounts indefinitely
- Print auditable trail / report when accessing doses



# Final NDR – Historical Data

- Agree on final transfer template by April 15
- Mines and NNR to agree upload period
- NNR holders upload all dose data (including for sources)
- SABS exclude all data for NNR holders
- SABS upload ALL data (DOH holders, staff)
- SABS to upload NNR staff dose data
- NDR lifetime doses for some, total doses for others
- All historical doses prepared by end May 2015



# Final NDR – Report Types

Template for all reports (logos)

- *Data Providers Reports*
- Worker
  - Total Dose all pathways
  - Calendar Year Dose
  - Year to Date Dose
  - 5 year block
- *Regulatory Reports*
  - Example Average Annual Effective Dose, Annual Collective Effective Dose, collective dose at different levels, number of workers exposed at different levels
  - DOH receive from SABS confirm by Feb 15
  - NNR to confirm by Feb 15





# Proposed Way Forward

December 14	Summary and Way Forward to NORM
January 15	Letters to NORM, Template, Users Manual
February 15	Response from NORM, Portal Info and Accounts, NORM practice upload, Legal Report NNR, Regulatory Report Types
March 15	NORM Practice upload
April 15	Meeting with Mines, Steering Comm meeting, Training and Pilot NORM kick-off, Finalisation of template (for 1y) for Roll-out
May 15	Pilot NORM, NNR ICT report, Historical Data Preparation
June 15	Pilot NORM, Historical Data Preparation and Submittal to NNR
July 15	IAEA Mission, Steering Comm meeting, Directives, COR changes, upload historical data
August 15	Roll-out



# NORM Process

April 2013	All holders invited to workshop, requested to provide dose information
8 May 2013	Workshop with NORM
21 October 2014	Invitations to NORM to participate in IAEA Expert Mission#3 (Dec 2014), to provide dose information
2 Dec 2014	Meeting with NORM, proposals and issues highlighted, agreed to address issues during April 2015, need for Pilot 2, Training for NORM on template not conducted
End Dec 2014	Proposed Way Forward to NORM after meeting

# NNR-NORM Meeting

April 2015 Meeting

Discuss NORM issues

- Frequencies of data uploads
- Impact of changes in Mine ownership
- Period of historical data to be uploaded
- EPD/area monitoring
- Need for submission of future reports
- Types of doses to be uploaded by NORM
- Implementation of NDR

Training of NORM on template (after practising)

Additional NORM Data Providers



# Other NORM DPs

- 15 NORM Data Providers
- Email addresses provided
- Database, output file and fields requested (email)
  - AMIS Vesuvius
  - Taulekoa TPT
  - Evander OMNIA
  - FOSKOR SAPS
  - Tronox RAPPA
  - ARCONSA* *Kabo*
  - Anglo Research ALS Minerals
  - Gold Fields-South Deep SA Metal
  - Zimkile



# Agreed NORM process

- Letters to NORM on 28 January 2015
- Invited to participate in Pilot 2
- Received responses from 6 organisations
  - Rappa, Foskor Richards Bay, Foskor Mining, AMIS, Gold Fields South Deep, Transnet Port Terminals
- Provided updated template v1.3, User's Manual, usernames, passwords
- Familiarise with filling of template, and upload prior to training session
- Thereafter start of Pilot 2



# Data Transfer Template for 2<sup>nd</sup> Pilot

- Template v1.3, finalised Feb 2015
- Separated dose fields in worksheets, summation, mandatory total, internal and external
- Dosimeter Type in separate sheet (4 types, add TLD, gravimetric sampling)
- No Individual and Workplace fields
- Option for Corrections of Dose Status
- Practice in company, list from SABS
- Replace First Name with Initials (Mandatory), make First Name optional
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# NDR User's Manual

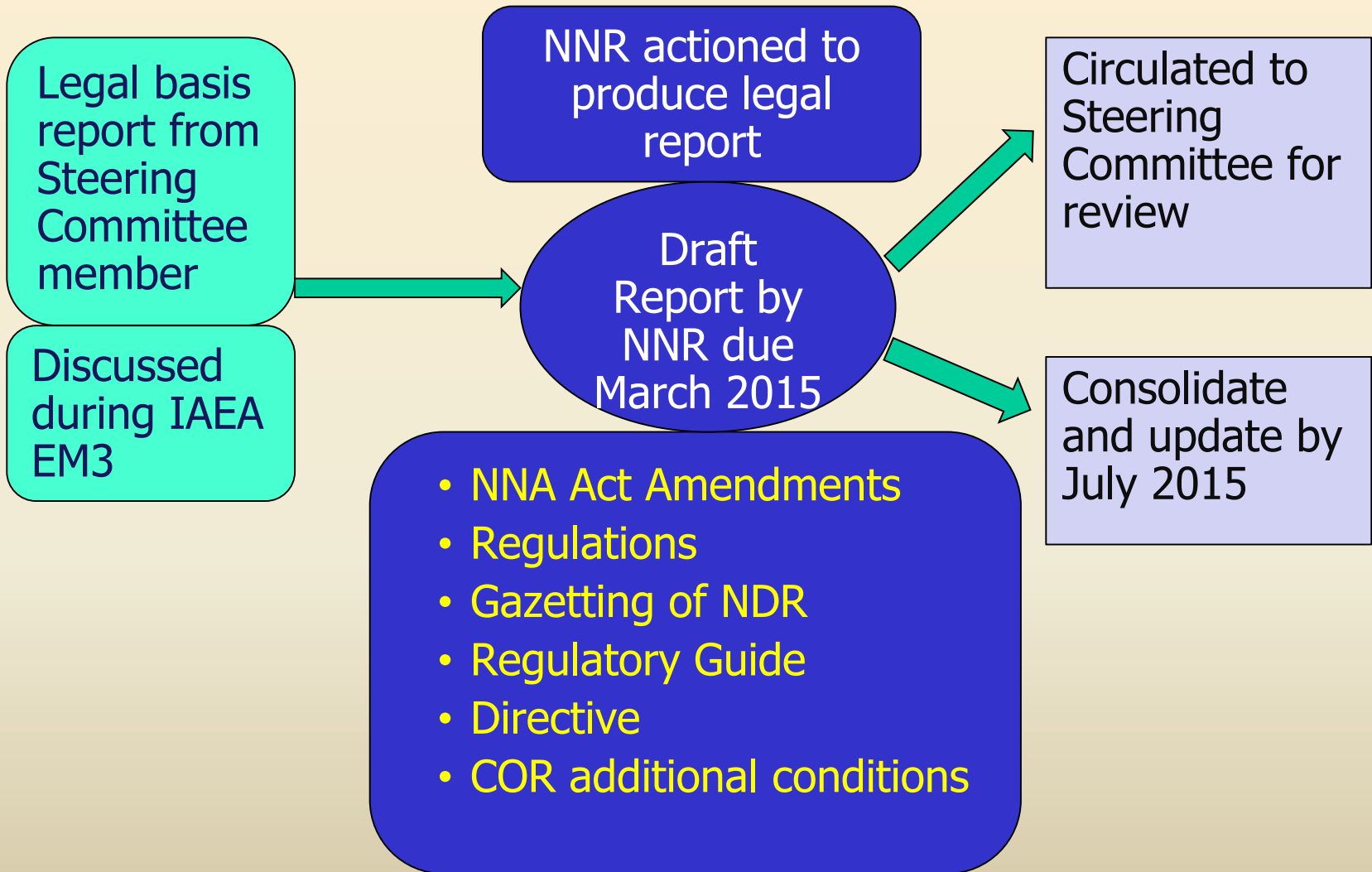
Finalised in February 2015

In NNR document format

- Included Web Portal, added screenshots of upload template, Portal
- DPs will not access RAIS, only Portal (upload and access to records)
- Comments from Pilot to be included or after each project milestone
- Clarity on what type of data to be uploaded by each category/DP
- Extremities for holders required (specify in Users Manual)



# NDR Legislation and Standards





# ICT Strategy

- Public server hosting the public upload portal and a local database (SQL Server Express)
- Capacity, Security of NDR
- Configuration and installation of Final NDR Server, Backing up and Archiving of Data
- Process pushing and pulling needed data
- Communication from processes in internal LAN
- Reports and checks to ensure accuracy of data
- Movement of uploaded files to internal database

Training of NNR staff on RAIS, SQL etc.

# Final NDR – Upload of Data

- Regulation/Directive/ COR conditions to upload data to NDR Portal
- 1 master account per Data Provider (DP)
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# Final NDR – Historical Data

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SABS exclude all data for NNR holders

SABS upload ALL data (DOH holders, staff)

SABS to upload NNR staff dose data

NDR lifetime doses for some, total doses others

All historical doses prepared prior to IAEA EM4



# Final NDR – Report Types

## *Data Providers*

- Total Dose all pathways
- Calendar Year Dose
- Year to Date Dose
- 5 year block

## *Regulatory*

- Average Annual Effective Dose for all workers regulated by NNR (NORM/Nuclear Installations)
- Annual Collective Effective Dose for all workers regulated by NNR (Nuclear Installations, NORM)
- Number of workers exposed at different levels e.g. <0.1, 0.1-5, 5-10, 10-15 and 15-20 and 20-50, > 50 mSv/a (Nuclear Installations, NORM)
- Max individual dose for each sector (nuclear/NORM AND technology (Power Reactor/Mining/Laboratories/Recycling etc.)
- DOH reports same as in SABS database



# NDR Project Schedule

#	Activity	Responsible	Delivery date
1	NNR Meeting NNR - NORM Data Providers	NNR	April 2015
2	Training of NORM on template and upload	NNR, IAEA Expert	April 2015
3	NDR Steering Committee meeting	NNR	April 2015
4	NORM Pilot kick-off	NNR	April 2015
5	Notes of NDR Steering Committee meeting	NNR	May 2015
6	NDR ICT report	NNR	May 2015
7	Pilot NORM completed	Data Providers	June 2015
8	Legal and Regulatory basis drafted	NNR, Radcon	July 2015
9	Final template for NDR Roll-Out	IAEA Expert	July 2015
10	Directives to holders on roll-out of NDR	NNR, Radcon	August 2015
11	Historical Data upload	DPs, IAEA expert	July/August 2015
12	IAEA NDR Mission #4	NNR, Radcon, IAEA	August 2015
13	NDR Steering Committee meeting	NNR	August 2015
14	Notes of NDR Steering Committee meeting	NNR	September 2015
15	Training of NORM on template and upload	NNR, IAEA expert	September 2015
16	Approved Regulatory Guide for NDR	NNR	October 2015
17	Roll-out of NDR and project handover	NNR, Radcon	December 2015

