

Annual oversight of NRCC 2023

Focus on NRCC annual report

By NRCC TF

Introduction

The NordREG Board established the Nordic Regional Coordination Centre Task force (NRCC TF) in June 2023. This Task Force has the responsibility to arrange a yearly oversight of the Nordic Regional Coordination Centre (NRCC) on the annual report from the NRCC and on selected topics. Since this is the first year of the NRCC TF, the focus area for the oversight is to evaluate the annual report 2022 that NRCC has published and no topics have been selected for a more detailed oversight. This report from the NRCC TF should be read together with the annual report from the NRCC¹.

The NRCC TF visited the NRCC in Copenhagen and have had a dialogue with NRCC throughout the year. On November 16 2023, NRCC TF and NRCC had a hybrid meeting where NRCC's annual report was presented and discussed along with a more detailed presentation and status of NRCCs tasks.

NRCC ANNUAL REPORT 2022

According to article 46 of the Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (Electricity Regulation) Regional Coordination Centres (RCCs) shall submit an annual report. The NRCC published their annual report on April 14, 2023. The annual report covers the period from December 6, 2021 until December 31, 2022. The NRCC was officially in operation on July 1, 2022, hence the reporting of their tasks in the annual report spans from the period July 1, 2022 until December 31, 2022. The annual report 2022 is the first version of NRCC annual reports.

NRCC REPORTING OBLIGATION

Article 46 of the Electricity Regulation states that:

1. Regional coordination centres shall establish a process for the continuous monitoring of at least:
 - (a) their operational performance;
 - (b) the coordinated actions and recommendations issued, the extent to which the coordinated actions and recommendations have been implemented by the transmission system operators and the outcome achieved;
 - (c) the effectiveness and efficiency of each of the tasks for which they are responsible and, where applicable, the rotation of those tasks.

¹ See the Annual Report 2022 on the NRCC website www.nordic-rcc.net

2. Regional coordination centres shall account for their costs in a transparent manner and report them to ACER and to the regulatory authorities in the system operation region.
3. Regional coordination centres shall submit an annual report on the outcome of the monitoring provided for in paragraph 1 and information on their performance to the ENTSO for Electricity, ACER, the regulatory authorities in the system operation region and the Electricity Coordination Group.
4. Regional coordination centres shall report any shortcomings that they identify in the monitoring process under paragraph 1 to the ENTSO for Electricity, the regulatory authorities in the system operation region, ACER and the other competent authorities of Member States responsible for the prevention and management of crisis situations. On the basis of that report, the relevant regulatory authorities of the system operation region may propose measures to address the shortcomings to the regional coordination centres.
5. Without prejudice to the need to protect security and the confidentiality of commercially sensitive information, regional coordination centres shall make public the reports referred to in paragraphs 3 and 4.

OVERSIGHT OF THE ANNUAL REPORT

Through the NRCC annual report 2022 NRCC has fulfilled the above-mentioned reporting obligation according to article 46 of the Electricity Regulation.

In this report about the oversight of the annual report, the NRCC TF have focused on evaluating some main parts from NRCC annual report. These parts include the following key services that NRCC presented in the annual report; Common grid model, Coordinated capacity calculation, Outage planning coordination, Short term adequacy, Coordinated security analysis. Followed by Financial reporting, Effectiveness & efficiency, Cooperation with Nordic TSOs, Cooperation with other RCCs, and the NRCCs future outlook.

Common Grid Model (CGM)

GENERAL REMARKS

One of NRCCs key services is Common Grid Model (CGM). According to article 37 of the Electricity Regulation each regional coordination centre shall carry out at least all the following tasks of regional relevance in the entire system operation region where it is established:(c) creating common grid models in accordance with the methodologies and procedures developed pursuant to the system operation guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009.

The CGM is described on a general level in the annual report. The CGM is based on Individual Grid Models (IGM) from the Nordic Transmission system operators (TSOs). The systems developed are still being refined and currently there is not a CGM for every timeframe. The quality of the result of the CGMs is based on the quality of the IGM provided to the NRCC from the Nordic TSOs.

TASK DESCRIPTION

The NRCC has described the status of the development as regards to the Nordic and the European Common Grid Models. Implementation of the European and Nordic CGMs are still ongoing due to problems with availability of relevant data from Nordic TSO side and IT-integration and modelling.

Based on the information received from the NRCC, NRCC does not yet participate in the Pan European process. For NRCC to deliver the regional tasks based on a CGM, a Nordic CGM process was set up and they have developed process as far possible. It has been difficult for the RCC to evaluate effectiveness and efficiency, but the NRCC expects that clear Key Performance Indicators (KPIs) can be set when they have gained more experience.

OUTCOME OF MONITORING

Based on the received information, NRCC TF conclude that the fulfilment of the CGM task is depending heavily on information from relevant Nordic TSOs.

The European process is also still unfinished but based on the information received from RCC this process of merging the different regional models is ongoing.

Coordinated Capacity Calculation (CCC)/Flow-based

GENERAL REMARKS

One of NRCCs key services is Coordinated capacity calculation (CCC). According to article 37 of the Electricity Regulation each regional coordination centre shall carry out at least all the following tasks of regional relevance in the entire system operation region where it is established: (a) carrying out the coordinated capacity calculation in accordance with the methodologies developed pursuant to the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009.

According to the Nordic Capacity Calculation Methodology (CCM) the flow-based methodology has been decided to be used in the Nordic Capacity Calculation Region (CCR Nordic). The chapter Coordinated capacity calculations in the NRCC Annual Report 2022 fulfils the reporting requirements according to article 46(3) of Electricity Regulation. Since the flow-based capacity methodology is not implemented yet, the chapter about CCC in the annual report will in the future contain more information from the results of flow-based.

TASK DESCRIPTION

When flow-based capacity methodology is implemented, NRCC will calculate the capacities using the flow-based methodology. Until flow-based is in operation, the Nordic TSOs calculate the capacities using the current capacity calculation methodology Net Transmission Capacity (NTC) and the NRCC is coordinating, delivering and verifying day-ahead capacities.

NRCC also perform the CCC task for CCR Hansa in cooperation with RCC TSCNET.

OUTCOME OF MONITORING

The NRCC is preparing for the implementation of flow-based, by developing IT systems, working on processes, simulating and analysing data. The Nordic RCC is currently performing simulations that are

called External Parallel Runs where they compare flow-based with the current capacity calculation methodology NTC. Reports with results and analyses from the External Parallel Runs are published on the Nordic RCC website and flow-based data parameters are published daily on the JAO website.

The implementation date for flow-based has been delayed due to development and alignment of Nordic IT systems and processes. Nordic RCC together with Nordic TSOs and NEMOs have informed about a new expected go-live date: October 2024.

Outage Planning Coordination (OPC)

GENERAL REMARKS

One of NRCCs key services is Outage Planning Coordination (OPC). According to article 37 of Electricity Regulation each regional coordination centre shall carry out at least all the following tasks of regional relevance in the entire system operation region where it is established:(f) carrying out regional outage planning coordination in accordance with the procedures and methodologies set out in the system operation guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009.

The purpose of the OPC task is to avoid critical grid situations due to planned outages. The cooperation with neighboring RCCs is important for this task to be successful.

TASK DESCRIPTION

The OPC task is in operation. At the moment the task is based heavily on experienced operators from the different Nordic TSOs with a deep understanding of their own grid. In the future, when the complexity of the grid is expected to be much higher than today, the process is going to be based primarily on the CGM. However, the input from the experienced operators will still be needed.

OUTCOME OF MONITORING

The Nordic RCC takes part in the rotational tasks on a weekly and yearly basis. Reporting on the Pan-European tasks is covered as part of ENTSO-Es Regional Coordination Assessment Report.

The Pan-European OPC Y-1 process for the year 2023 was completed on November 30, 2022.

The NRCC perform the OPC task for the timeframe W-1 and W-4 every week since the start of the Nordic RCCs operation.

The NRCC has issued 16 recommendations as a result of the OPC task. All recommendations have been followed or solutions that are more efficient have been found.

Short term Adequacy (STA)

GENERAL REMARKS

One of NRCCs key services is Short Term Adequacy (STA). According to Article 37 of Electricity Regulation each regional coordination centre shall carry out at least all the following tasks of regional relevance in the entire system operation region where it is established:(e) carrying out regional week-ahead to at least day-ahead system adequacy forecasts and preparation of risk reducing actions in accordance with

the methodology set out in Article 8 of Regulation (EU) 2019/941 and the procedures set out in the system operation guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009.

The chapter on Short Term Adequacy (STA) is concise; however, it still fulfils the reporting requirements according to article 46(3) of the Electricity Regulation. The presentation is clear and structured. NRCC is currently conducting STA and has plans to enhance coordination and improve communication among the relevant TSOs.

In the future outlook, the NRCC states that both NRCC and the Nordic TSOs have a clear path to coordinate and improve communication with neighbouring regions.

TASK DESCRIPTION

The annual report provides a brief description of the purpose of STA, the two parallel processes of STA, and a somewhat deeper introduction to the pan-European process. The annual report lacks a presentation of the legal background explaining why and how NRCC should conduct the STA process, for example, a reference to Article 81 in Regulation (EU) 2017/1485.

The RCC is obligated to conduct regional adequacy assessments at least one week in advance. Therefore, NRCC must analyse the adequacy situation a week ahead – meaning that RCC assesses whether it is possible to meet demand under the given regional network constraints. The analysis is based on forecasts of load, transmission capacity, and production capacity. These data are provided by TSOs, who are obligated to provide RCC with necessary information for the analysis, as per Article 81(2) of Regulation (EU) 2017/1485. The STA task is carried out every day for the next seven days. If the analysis identifies an adequacy situation, NRCC will facilitate coordination among the relevant TSOs, as per Article 81(3) of Regulation (EU) 2017/1485. This is in line with NRCC's information in the sub-chapter that describes the task.

STA covers two parallel processes: one for the Nordic Area and one pan-European process. NRCC forwards input on behalf of the Nordic TSOs in the pan-European STA process.

OUTCOME OF MONITORING

In this sub-chapter, NRCC has reported on the task using three charts that illustrate operational performance from July to December 2022. From the charts, it can be observed that the Nordic process is largely completed before 8:30 AM. NRCC also predominantly sends TSO data to PE STA tools before the deadline. The main reason for incomplete processes is IT connection issues that have been resolved after the task deadline. Regarding the days NRCC did not send data to the pan-European process, this is also due to IT issues in the initial part of the process.

The last figure indicates that NRCC lacked data from Nordic TSOs on approximately 3% of days in August and September. In November, TSO data was missing on almost 7% of days.

Coordinated Security Analysis (CSA)

GENERAL REMARKS

One of NRCCs key services is Coordinated Security Analysis (CSA). According to Article 37 of the Electricity Regulation each regional coordination centre shall carry out at least all the following tasks of

regional relevance in the entire system operation region where it is established:(b) carrying out the coordinated security analysis in accordance with the methodologies developed pursuant to the system operation guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009.

The chapter on CSA is well-structured and touches on all topics the reporting should address according to Article 46 of the Electricity Regulation. The development of the CSA is still at an early stage in the Nordics and a simplified version is planned to go live in 2024 to support the Flow-based capacity methodology Go-Live. CSA will be developed further with a stepwise approach to implement the target solution, although based on the annual report it is not in the near future.

The annual report could have provided more information on concrete plans and milestones in the implementation of the target solution. Regarding the work on CSAv1 the NRCC TF has been informed that the work had to be paused in February 2023 due to data quality issues, hence a new course of action had to be worked out.

NRCC announces in its future outlook that focus will be on the implementation of Nordic ROSC (NROSC) with full remedial action optimization, in both day-ahead and intraday time horizons. A Nordic Remedial Action Optimization Methodology will be developed to ensure that the implementation approach provides the needed value for the Nordic TSOs. Such work could also provide basis for and facilitate a revision of relevant Nordic methodologies according to regulation (EU) 2015/1222 and/or regulation (EU) 2017/1485.

TASK DESCRIPTION

The annual report contains a brief description of the main purpose of CSA and that current activities are based on Regulation (EU) 2017/1485, the high-level CSAM and the more specific NROSC.

For the sake of clarity, it would have been beneficial with a brief introduction to the legal/ regulatory framework governing the CSA and the NRCC's role and tasks regarding this. Then it would have been easier for the reader to gain insight into, not only the current situation, but also what is the RCC's role and tasks regarding CSA according to the target solution.

The sub-sections *Nordic CSA* and *Implementation status* describe how the work on CSAv1 for the day-ahead timeframe is performed by TSOs and NRCC operators using manual processes and verbal coordination. It is specified that optimization remedial actions are not yet included in the CSA. The annual report presents the status of the CSA work in a good way and explains what the challenges and shortcomings in the further development of the CSA services are.

OUTCOME OF MONITORING

The sub-section *operational performance* contains two diagrams; figure 18 shows the percentage of successful runs of the CSA process from July to December 2022 in terms of the monthly quota of MTUs for which the results of the CSA are available and figure 19 is showing the reasons of failed runs relative to the monthly number of MTU's missing CSA results. The latter shows that the reasons of failed runs are mainly caused by data delivery issues and to some extent tool and data quality issues. It will provide more insight if the tools are developed further enabling to distinguish between tool issues and data quality issues as reasons for failed runs.

NRCC states in the annual report that the current version of the CSA does not include remedial action optimization nor suggestions for remedial actions to the TSO operators, hence no coordinated actions are issued yet, and it is not yet possible to measure their effectiveness, since the focus is to investigate how to verify the accuracy of the security analysis itself. It is important going forward that the TSOs do what is needed to enable the NRCC to carry out its tasks.

Financial reporting

According to article 46(2) of the Electricity Regulation regional coordination centres shall account for their costs in a transparent manner and report them to ACER and to the regulatory authorities in the system operation region.

The annual report from the NRCC contains the economic key figures required.

In the future, the NRCC expects the expenses of software development and maintenance to increase. The organization still needs more staff. The NRCC has been successful in attracting well-educated and qualified staff. However, since the work is highly specialized all new employees must be trained inhouse. The NRCC has hired many new staff and it takes time for the organization to grow in a healthy way. The staff turnover is relatively low, which is good.

Effectiveness and efficiency in the annual report

According to Article 46(1) of the Electricity Regulation regional coordination centres shall establish a process for the continuous monitoring of at least: (c) the effectiveness and efficiency of each of the tasks for which they are responsible and, where applicable, the rotation of those tasks.

NRCC has throughout the annual report made remarks on the measuring of effectiveness and efficiency. However, many of the remarks are general and lack description of key performance indicators (KPIs).

The EU regulation gives very little guidance on the measuring of the effectiveness and efficiency. NRCC will continue the work to measure the effectiveness and efficiency of the tasks performed and develop KPIs.

NRCC TF finds that the measuring of effectiveness and efficiency needs to be a point of focus for the NRCC. The NRCC TF will continue the dialogue with the NRCC about measuring of effectiveness and efficiency and the development of KPIs.

Cooperation with the TSO's

INDEPENDENCY

The TSOs of Sweden, Finland, Norway and Denmark (Nordic TSOs) own the NRCC. However, the NRCC should also be an independent entity.

The TSOs and the ENTSO-E develop the methodologies used by the NRCC. The NRCC in cooperation with the TSOs implements the methodologies. The NRCC cooperate with the TSOs on practical solutions in the Cooperation Committee where the TSOs can share their thoughts and problems to the NRCC and in return, the NRCC can present ideas and solutions to the TSOs.

INFORMATION AND DATA QUALITY

The tasks performed by NRCC are based on data coming from the TSOs and the quality of the data is vital. It has been a process to reach a level of mutual trust for the TSOs to deliver sensitive data to the NRCC. Now the cooperation works well between the NRCC and the TSOs. There are well-established data exchange systems in the Nordics with secure and trusted procedures at NRCC. There are still challenges on a Pan European level regarding data exchange to the Pan-European platform.

There are problems with data quality in some areas. NRCC has pointed out that the key to improving the data quality is continuous cooperation between the NRCC and the TSOs as well as investments in software and staff on both sides. The NRCC and the Nordic TSOs have a common prioritization regarding data delivery and quality.

NRCC TF finds that accurate and reliable data quality is important for all NRCC tasks.

Cooperation with other RCCs

NRCC cooperates with the other RCCs within the RCC Working Table (RWT). The RWT is a voluntary forum for sharing of knowledge and best practices.

NRCC also work together with other RCCs under the framework of ENTSO-E. A dedicated Steering group on regional coordination (StG ReC) has been established under ENTSO-E's system operations committee (SOC). The NRCC participates in StG ReC and underlying groups. A description from ENTSO-E's homepage: "Steering Group Regional Coordination facilitates, coordinates and develops regional coordination, most notably amongst Regional Coordination Centres (RCCs) and TSOs. The Steering Group steers the business requirements, business development, implementation, rollout and operation of the RCC tasks where a pan-European or cross-regional approach is legally required or is requested by TSOs. For regional RCC tasks, it facilitates cooperation and coordination among the regions and RCCs and monitors the performance of those tasks."²

NRCCs Future Outlook

The NRCC is still a young organization and there are still many tasks that are under development. The NRCC needs to prioritize between many important tasks. In order to perform the tasks, NRCC need to develop new software solutions and processes and the Nordic TSOs need to provide NRCC with the necessary data. This prioritization between tasks must therefore be done in close cooperation with the Nordic TSOs. Not only because the task cannot be performed without input of relevant data from the TSOs but also because a task can only add value if the TSO can use the data results in the operation of the grid.

Conclusion

The NRCC TF notes that the NRCC annual report covers all topics the reporting should address according to Article 46 of the Electricity Regulation.

The NRCC TF views the annual report as a document addressed to the NRCC TF and the owner Nordic TSOs, and the public at large.

² <https://www.entsoe.eu/about/system-operations/#how-we-are-organized>

The reporting in the annual report is on a very general level, and therefore many details are not mentioned. The NRCC TF finds that some subjects could have been described more in detail. The reporting contains many areas where the current state and the target state is far apart. This is expected, since the NRCC is very new and has many new and complex tasks. NRCC TF finds that a description of the milestones from the current state to the target state for the tasks would be valuable in the future annual reports.

The NRCC TF will continue to have exchanges with NRCC regarding status updates of their tasks and will continue the dialogue for example regarding the reporting on effectiveness and efficiency from the NRCC.

The NRCC TF found no reason to make any annotations on the reporting from the NRCC.