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# Study of Organizational Knowledge Retention Practices in the Utilities

*One key to the successful and long-term survival of an organization involves knowledge capture and retention. The knowledge may include company secrets, lessons learned, and hard-earned best-practices that are lost, forgotten, or disorganized in the event of staff loss or early retirement. In the United States, the aging workforce poses a specific difficulty vis a vie utility workers. Many are quickly approaching retirement and operations staff are heavily impacted by this movement. Properly capturing and retaining employee's tacit knowledge is a labor-intensive task as it is usually transferred through personal observation with demonstration, mentors, apprenticeships, or on-the-job training. Consequently, articulating the tacit knowledge of an aging workforce is a challenging and time-consuming effort without proper preparation, oversight, and application of established knowledge retention strategies.*

*It is advantageous for an organization to have implemented a fully encompassing knowledge management (KM) system during its inception; an exit interview is not enough. The development should begin concurrently with the hiring process, thus capturing newfound knowledge early. An accessible database for critical company data aids in knowledge retention, but even proven methods cannot capture all knowledge efficiently. The system is often overburdened by an abundance of information, which results in indistinguishable lessons and outdated instructions. It is crucial to have a balanced and working system for a functioning organization, but any implementation is preferable to none. This paper examined the methods and strategies utilized to capture and retain critical information within a local utility. Current operations staff and management have provided data by completing a Knowledge Management Capability Assessment. It was determined that the utility has a low operational knowledge management capability. This process has increased the understanding of current KM strategies and provides the local utility actionable data to improve upon or develop such strategies.*

Keywords: knowledge retention, utility workers, tacit knowledge, explicit knowledge, aging workforce

## Introduction

Without proper management, important knowledge regarding complex boiler and turbine operations can be quickly lost in the transfer between older and younger employees. It is of great interest to the utility to capture this operational knowledge and pass it from one generation of workers to the next properly and succinctly. The aging workforce poses a difficult obstacle, with reports of employees within the industry nearing retirement age being published regularly in the early 2010s [1] [2] and illustrated in Table 1 [3]. This is prevalent at the local utility, where most senior operations staff are at or nearing retirement age, with several purposefully asked to stay beyond their qualified retirement. The researchers completed a Knowledge Management Capability Assessment (KMCA) questionnaire that was validated at its publication [4]. This questionnaire provided the team and the utility management with a succinct description of the KM capability of the operations and maintenance staff in their work environment, and was utilized to discover areas requiring improvement for utility improvement. Following is the literature review that focused on the widespread effect or use of KM tools with regards to the power generation industrial applications, including knowledge retention, defining explicit and tacit knowledge, the aging workforce, and finally the utility worker.

## Literature Review

While searching for evidence on organizational knowledge retention practices, a great deal of research was discovered on white-collar workers. Workers doing manual labor or more specifically in utility plants, however, are lacking. This review provided an overview of different types of knowledge, statistics regarding the aging workforce, and an introduction to the research of utility workers.

As this paper focuses on knowledge and knowledge retention, it was important to define both explicit and tacit knowledge. These definitions aid in explaining the importance and difficulty of retention and management. Davenport [5] has defined knowledge as information with the most value for an organization, and as being the most difficult to manage of the data-information-knowledge scale. Knowledge of an individual is derived from personal experience, context, and multiple sources of information. That knowledge that is difficult to articulate is classified as tacit, while the knowledge which is readily codified and shared is explicit. Explicit knowledge is readily accessible information that can be simply stored and shared [6]. An appropriate example would be a simple start-up procedure of an air-compressor or the numerous valves required for a boiler start-up procedure. It can be listed and distributed among unskilled workers and accurately convey the information. This is most evident in training programs for new hires, where they are given facts and nominal operational statistics regarding the utility. Tacit knowledge is gained through personal experience and is not readily articulated or codified as it more closely resembles intuition [7]. It originates from Polanyi [8], where he describes it as how a person knows more than they can tell. The ‘know-how’ that is owned by seasoned employees was gained by actively participating in operations throughout their career and being forced to solve problems and understand the system without outside assistance. This can then be passed on to newer employees by showing or explaining the operation and outlining cause and effect relationships within an institution. This de-facto standard practice of all industries has changed little over the years as it is relatively successful if actively pursued. Tacit knowledge must also be captured for use in increasingly automated systems. Industry needs reliable methods for its capture and analysis to be best utilized in the transfer of manual work to automated systems and the introduction of new technologies and processes [9]. Johnson et al. [9] focused on manufacturing applications, but the same is true in the utility where facilities rely on automation of the process to ensure correct and safe operation.

The workforce is aging and while most workers in utility plants have held their positions for decades, the newer workforce does not follow this same trend. As of 2011, it was estimated that 45-50% of the baby boomer workforce would retire or leave the utility industry, thus removing a generation of knowledge [2]. Grice [2] also outlines the decline in power engineering programs and students nationwide, leading to more opportunities than graduates. This combination is deadly to any industry seeking to maintain or grow. With traditional power generation facilities being phased out for renewable energies, much of the tacit knowledge will be lost to age. In nuclear utilities, the widespread regulation and standardization of operational practices present options in knowledge retention and management. This includes the Nuclear Energy Institute Standard Nuclear Performance Model which evaluates the critical elements of an existing business [10]. This type of nationally standardized model is nonexistent for traditional plants, as they are regulated by the utility corporation that owns the facility and as such varies from company to company. This lack of comparable standardized resources leaves it up to utilities or individual generation plants to develop their performance models or other methods of avoiding an aging workforce.

Table 2 in Appendix A contains the labor force statistics for 2019 of employed persons by detailed industry and age and by detailed occupation and age. It was derived from tables describing employed persons by detailed industry and age, as well as employed persons by detailed occupation and age [3]. Table 2 reports that the median age of those in the *Electric power generation, transmission, and distribution* is 44.7 years. This leaves half of the workforce two decades from retirement, with more than half of that population being 10 years or less until retirement. It continues to report the median age of *Stationary engineers and boiler operators* at 53.3, leaving nearly half of all those in that classification either 10 years from retirement or past retirement age. A startling majority of those crucial to maintaining our national grid supply is nearing or past retirement age. Without proper KM and retention practices being employed, the industry stands to face the loss of decades worth of tacit knowledge that could irreversibly damage it.

Not only does the aging workforce present the difficulty of knowledge loss through retirement, but also their resistance to change and unwillingness to participate in interviews and other activities. In previous work, this resistance was met during the scheduling of interviews and the interviews themselves, where the operators were unable to or refused to give detailed information [11] [12]. There is little overall research into utility workers beyond their immediate and long-term safety from exposure to hazards in their workplace. While this is important research, it applies much of the KM research to nuclear or specific KM contracting organizations. Another area of active research is the retention of blue-collar style workers, which is best achieved through rewards and recognition of the employee [13]. Hanes and Gross [12] provide guidance when eliciting knowledge from workers who have been considered experts or who have specific and desired expertise. Understanding the willingness of a participant to share this expertise is important and must be respected. Willingness ranges from being honored to share, to fear of losing one's job once their knowledge is no longer their own [12]. This is also exemplified within the local utility and should be referenced when specific knowledge is sought [11].

Having an older and experienced workforce aids utility operation through normal and abnormal situations. They own a plethora of tacit knowledge. They also have set retirement dates. Combined, they present a difficult situation to ensure the future success of the utility. A strong strategy is the employment of KM systems to capture and disseminate that tacit knowledge to less experienced or new employees. Thus, it is of interest to observe how the local utility is equipped to manage the retirement of several key employees regarding their KM system.

**Research Questions**

After reviewing relevant literature, research questions were developed to support the authors' desire to learn more about the specific plant. Considering the current KM system, the authors are answering the following questions:

- *How adept is the current knowledge management system in providing ongoing support in the growth of the employees in the plant?*
    - *What is the level of success the plant has in the areas of culture, data, expertise, knowledge documents, and lessons learned?*
- *How do employees respond to the knowledge management system?*

**Methodology**

In place of a traditional, semi-structured, or unstructured interview, the researchers sought a validated instrument to evaluate the local utility. The need for a validated instrument stems from the research and data collection focus of the paper; a novel methodology is not the goal. It was also important to reach as many employees as possible and receive full responses regarding aspects of the KM system. Kulkarni and Freeze [4] proposed and validated a Knowledge Management Capability Assessment (KMCA) through empirical study. This KMCA was chosen for its widespread applicability, its capability level rating system, and its statistical validity [4]. It uses a Likert Scale that allows rating of capability level from “0 (Not Possible)” to “5 (Continuously Improved)”, with each level having further classification regarding the percent completion [4]. The higher capability levels are only achievable through the fulfillment of those immediately below, through subjective questioning. The application of this assessment allowed the researchers and interested parties to obtain a quantitative view of the utility capability in its KM strategies and ideologies.

Through this assessment, the researchers and interested parties gained a quantitative representation of the participants' view of the KM systems and ideology. A positive response in the survey denotes that the system is in place and working well, while a negative response indicates the lack of or dissatisfactory performance of those systems. The full KMCA questionnaire contains 102 questions, which researchers deemed to be too long based on previous experience with the operational group. [11]. Thus, the questionnaire was shortened to the first three levels to ensure completion. After internal deliberation and initial questioning of managerial staff, the questionnaire was shortened to only include those questions from capability levels 1 through 3. It was agreed on pre-application that the utility would not likely reach level 2, so level 3 was included as a buffer in order to test the assumption.

The questionnaire was administered using Qualtrics, an online survey software, through an email link. It is a secure surveying tool, and its familiarity within the utility will prevent possible confounding variables in data collection [12]. Through this application and by design the responses are kept anonymous. The only information gathered is the responses to the capability questions. This is to encourage participation and encourage honest responses in evaluating their workplace. The questions administered were derived from “Table 2. KMCA Scale items and Capability Levels” in Kulkarni and Freeze [4]. The questions attempted to remain as simple as possible, to retain the identity that was portrayed by Kulkarni and Freeze, and are in Appendix A, Table 3 [4]. The answers are to be collected in a Likert Scale 1-5, with 1-Strongly Agree through 5-Strongly Disagree. Once collected, the responses were compiled and analyzed using Microsoft Excel. The final answers were first individually averaged, with an average under 3.0 considered to be a positive response and an average above 3.0 negative response. A positive response is passing, and a negative response is failing as set by the questionnaire guidelines [4].

Then the answers were organized based on their capability level 1-3 so that the capability level achieved was readily apparent. Further sorting by the category abbreviation and question number was completed to show any trends within categories. The category abbreviations are as follows: CQ for culture questions, DQ for data questions, EQ for expertise questions, KQ for knowledge document questions, and LQ for lessons learned questions [4]. The original number assigned to the questions were kept ensuring continuity from the originating table, thus the question numbers appear to have gaps. For ease of viewing averages above 3.0 were shaded. The final amalgamation of data is in the Findings section as Table 1. A separate table was devised showing the count of each Likert Scale response per question and is in Appendix C. This was accomplished to illustrate the exact response breakdown per question, and to highlight possible trends in the range of positive, negative, and neutral responses.

**Findings**

The questionnaire was shared with a study population of forty-three individuals. Thirty-two began a response, and of those twenty-three completed it. From the data collected and based upon the interpretation that an average less than 3.0 is a positive response and greater than 3.0 is negative, it is shown in Table 3 per the KMCA that the utility did not reach any capability level. The utility did pass all questions related to data and knowledge documents. However, the data reported the utility failing question CQ10, rated at capability level of 1, with an average response of 3.04. This was the only question with a capability level of 1 that failed. Six respondents gave a positive response while six also gave a negative response. The failure stems from the weights given using the averaging method, with two responses of Strongly Disagree and four of Disagree to one Strongly Agree and five Agree. The remaining eleven respondents chose the Neutral answer. Two further culture questions were reported as failed, with one each in capability levels 2 and 3. Expertise questions had the greatest failure rate, as nine of fifteen administered had failing averages. Of those, one was in capability level 2 with the remaining eight in capability level 3. Failed questions refer to advanced expertise repository functions, expert personnel repositories, and special interest groups. Lessons learned questions also had a high failure rate with seven of thirteen receiving overall negative responses. These questions all had a capability level of 3 and asked about lessons learned repositories and the regular application of them. Overall, only one capability level 1 question and two level 2 questions failed. That leaves sixteen level 3 questions that failed, and the remaining thirty-seven questions that passed.

| Question Number | Capability Level | Average |
|---|---|---|
| CQ5 | 1 | 1.61 |
| CQ6 | 1 | 2.30 |
| CQ8 | 1 | 2.57 |
| CQ10 | 1 | 3.04 |
| EQ1 | 1 | 2.39 |
| LQ1 | 1 | 2.91 |
| CQ1 | 2 | 2.78 |
| CQ2 | 2 | 2.74 |
| CQ4 | 2 | 2.48 |
| CQ14 | 2 | 3.65 |
| DQ1 | 2 | 1.65 |
| EQ2 | 2 | 1.30 |
| EQ26 | 2 | 3.52 |
| KQ1 | 2 | 1.35 |
| KQ2 | 2 | 1.48 |
| LQ2 | 2 | 1.65 |
| LQ3 | 2 | 1.48 |
| CQ3 | 3 | 2.83 |
| CQ7 | 3 | 2.48 |
| CQ9 | 3 | 2.83 |
| CQ11 | 3 | 3.09 |
| DQ2 | 3 | 1.91 |
| DQ3 | 3 | 2.57 |
| DQ4 | 3 | 2.74 |
| DQ8 | 3 | 2.65 |
| DQ9 | 3 | 2.78 |
| DQ13 | 3 | 2.91 |
| EQ3 | 3 | 2.91 |

| Question Number | Capability Level | Average |
|---|---|---|
| EQ4 | 3 | 2.96 |
| EQ5 | 3 | 2.52 |
| EQ6 | 3 | 2.74 |
| EQ7 | 3 | 3.22 |
| EQ10 | 3 | 3.43 |
| EQ14 | 3 | 3.39 |
| EQ18 | 3 | 3.09 |
| EQ20 | 3 | 3.13 |
| EQ23 | 3 | 3.39 |
| EQ25 | 3 | 3.22 |
| EQ27 | 3 | 3.57 |
| KQ3 | 3 | 2.39 |
| KQ4 | 3 | 2.52 |
| KQ5 | 3 | 2.17 |
| KQ6 | 3 | 2.65 |
| KQ9 | 3 | 2.91 |
| KQ12 | 3 | 2.87 |
| KQ16 | 3 | 2.43 |
| LQ4 | 3 | 2.96 |
| LQ5 | 3 | 3.48 |
| LQ6 | 3 | 3.57 |
| LQ7 | 3 | 3.26 |
| LQ8 | 3 | 3.48 |
| LQ11 | 3 | 3.52 |
| LQ14 | 3 | 3.43 |
| LQ16 | 3 | 2.87 |
| LQ18 | 3 | 3.17 |
| LQ20 | 3 | 2.91 |

Table 3: Averaged Questionnaire Responses

To understand this outcome, Table 4 of Appendix C was created to count the number of responses per Likert scale for each question. Utilizing this it was found that the Neutral answer was used over one-hundred times more than the next most used, which was Agree. Averaging the total counts of each response revealed that 42% of responses were positive, 34% were neutral, and 24% were negative. Further, the overarching average of every response was approximately 2.75, indicating a generally positive attitude towards the content of the questionnaire.

**Discussion**

After collecting the data, the responses were reviewed and are discussed by the level of relevance to the research questions. The failure of question CQ10 “There is a willingness to share knowledge at Wade as a whole” is indicative of a work environment whereby the employees are more focused on their wellbeing than that of the workplace. The question had an average response of 3.04, with the failure being attributed to the weight of the answers given. An unwillingness to share knowledge, especially among older and retiring employees, will hurt the utility as it remains with the exiting employee and may not be shared. This loss of knowledge can be detrimental to a facility that relies on its older and more experienced employees to react and solve dangerous situations. The loss could be readily addressed by management through active encouragement and recognition of sharing knowledge. Doing so would also assist in rectifying questions CQ11 and CQ14 which reference regular practice and recognition of knowledge sharing, respectively. This action would improve the utility to capability level 1, and potentially level 2 if CQ14 is resolved. The expertise question at capability level 2 that failed, EQ26, inquired about encouragement to participate in special interest groups. A special interest group is a tool utilized by organizations to further specific expertise, technology, or solutions to emerging problems. An increase in participation of these types of groups would allow inexperienced employees the opportunity to interact with those who are older and more knowledgeable. This would work to benefit the utility by helping find solutions and add a level of mentorship that is a cornerstone to the transfer of critical tacit knowledge. These two actions would elevate the utility to capability level 2. This demonstrates the general robustness of the KM system, although improvement in both expertise and lessons learned is required for advancement to capability level 3.

The failures in the expertise and lessons learned categories are due to the lack of documentation practices, and repositories with advanced functions. The categorization of both is a difficult job, in which employees must be actively maintaining the system to ensure the expertise personnel and lessons learned are current and represent best practices. The lack of a repository, advanced or otherwise, is troublesome and surprising since the utility passed all knowledge document and data related questions. These passed questions related to the storage and accessibility of knowledge documents and data, showing the organization of explicit knowledge is present. The tacit knowledge inherent with expertise and lessons learned is difficult to properly capture, which is perfectly emphasized within these results. Despite a lack of support in tacit KM strategies, the utility and its workers maintain excellent control over their explicit KM systems. The overarching tallies and averages from Table 4 in Appendix C reveal that the respondents are generally positive about KM. Less than a quarter of the total responses were negative. The amount of positive response is an excellent sign that strategies designed for tacit KM retention would be welcomed much like the explicit KM systems currently in place.

## Conclusion

The findings from this study indicate that the current KM system maintains explicit knowledge but does not retain true tacit knowledge. While they do provide some ongoing support, further work in this area is needed to avoid a gap in knowledge and potential future operational issues. Knowledge document and data systems were found to be robust and trusted as all questions relating to them were passed. These areas relate to explicit and basic information regarding plant operation and statistics which can be used in training new employees. As a new employee begins to move beyond surface understanding, they will potentially struggle through poor culture, a lack of tacit knowledge, and expertise management. The culture within the utility regarding knowledge sharing is weak. The questionnaire indicates that sharing is neither willingly nor regularly practiced, and there is no positive managerial support to engage in sharing. Insufficient documentation and organization of accumulated experience prevent employees from learning from the past, forcing reliance on experienced employees. Similarly, lack of expertise management illustrates little effort in understanding and maintaining the tacit knowledge of the utility. It is important to reiterate that while the higher capability level questions failed, the entire questionnaire had less than one-quarter of the responses as negative. Overall, the employees support and understand the current KM system, despite its deficiencies. Finally, the current system and strategies are sufficient in explicit knowledge retention but do not adequately address tacit knowledge.

## Future Work

It is of interest to work with other utilities, whether local or university-based, to compare their relative KM capability levels. Surveying local utilities will provide insight into regional trends of KM capability, while university utilities could be outliers given their proximity to and management by the university. It is also imperative that the scaling of answers be revisited, to avoid excessive use of the neutral response. Furthering the general understanding will allow for systemic adjustments towards stronger KM methodology, strengthening the industry as it seeks its next generation of employees.

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## Appendix A – Combined Tables Showing Employed Persons by Industry and Age (US Bureau of Labor Statistics)

Table 2: Employment and Industry by Age [3]

| Industry/Occupation (numbers in thousands) | 2019 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | 16 to 19 years | 20 to 24 years | 25 to 34 years | 35 to 44 years | 45 to 54 years | 55 to 64 years | 65 years and over | Median age |
| Electric power generation, transmission, and distribution | 1,377 | 8 | 59 | 286 | 325 | 322 | 321 | 55 | 45 |
| Power plant operators, distributors, and dispatchers | 43 | 0 | 1 | 8 | 11 | 11 | 9 | 2 | - |
| Stationary engineers and boiler operators | 52 | 0 | 0 | 11 | 5 | 13 | 18 | 6 | 53 |

**Appendix B – Instrument Questions**

Table 3: Questions Administered through the Qualtrics questionnaire [4].

| | | |
|---|---|---|
| CQ1: Your leadership is committed to knowledge sharing. | EQ2: Experts and expertise are important. | KQ6: There is access to internal and external documents within the repository. |
| CQ2: Your leadership communicates about the importance of knowledge sharing. | EQ3: Expertise repositories are available. | KQ9: The Knowledge Documents are well labeled and organized. |
| CQ3: Your leadership sets knowledge sharing strategies and goals. | EQ4: Expertise repositories are easily accessible. | KQ12: There is an established categorization process for Knowledge Documents. |
| CQ4: Your leadership encourages knowledge sharing. | EQ5: Expertise repositories have useful content. | KQ16: It is common practice to refer to and use Knowledge Documents. |
| CQ5: You consider knowledge an asset. | EQ6: Information in the repository is about internal and external experts. | LQ1: There is an acknowledgment of previously learned lessons. |
| CQ6: There is a willingness to share knowledge within your immediate workgroup (ex. Those whom you regularly work with). | EQ7: The repository has search capabilities. | LQ2: It is important to look for lessons learned. |
| CQ7: There is a regular practice of knowledge sharing within your immediate workgroup. | EQ10: The repository content is well classified and organized. | LQ3: It is important to reference lessons learned when performing a task or starting a project. |
| CQ8: There is a willingness to share knowledge within your entire working group (operators, maintenance, other). | EQ14: Experts are registered and profiled based on their respective knowledge. | LQ4: There is a successful application of lessons learned. |
| CQ9: There is a regular practice of knowledge sharing within your entire working group. | EQ18: There is a regular practice of looking for available expertise. | LQ5: Lessons learned are available in a centralized repository or location. |

| | | |
|---|---|---|
| CQ10: There is a willingness to share knowledge at Wade as a whole. | EQ20: Experts are assessed as a part of normal work practices. | LQ6: Lesson learned repositories are easily accessible. |
| CQ11: There is a regular practice of knowledge sharing at Wade as a whole. | EQ23: There is access to internal/external experts via collaboration tools. | LQ7: The content of the lesson learned repository is useful. |
| CQ14: There is recognition or rewarding of activities associated with knowledge sharing. | EQ25: You participate in special interest groups. | LQ8: The repository has established search and retrieval capabilities. |
| DQ1: It is important to make data driven decisions. | EQ26: There is encouragement to participate in special interest groups. | LQ11: The repository content is well classified and organized. |
| DQ2: Making data driven decisions is part of your job. | EQ27: Special interest groups are readily available. | LQ14: There is a practice of capturing lessons learned at Wade. |
| DQ4: Data repository(ies) are easily accessible. | KQ1: Knowledge Documents are important. | LQ16: Capturing lessons learned are the responsibility of the individual and the group. |
| DQ8: Data is collected in a timely manner. | KQ2: It is important to reference Knowledge Documents. | LQ18: Lessons learned are regularly applied and used. |
| DQ9: Data collected is complete. | KQ3: There is a Knowledge Document repository(ies). | LQ20: Looking for lessons learned is embedded within normal working practices. |
| DQ13: Data support tools are sufficient. | KQ4: Knowledge Document repositories are accessible. | |
| EQ1: There is an acknowledgment of the existence of experts and expertise. | KQ5: Knowledge Document repositories contain useful information. | |

**Appendix C – Individual Responses**

Table 4: Count of Likert scale responses to individual questions.

| Question Number | Capability Level | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| CQ5 | 1 | 16 | 2 | 4 | 0 | 1 |
| CQ6 | 1 | 8 | 6 | 3 | 6 | 0 |
| CQ8 | 1 | 3 | 9 | 7 | 3 | 1 |
| CQ10 | 1 | 1 | 5 | 11 | 4 | 2 |
| EQ1 | 1 | 4 | 11 | 5 | 1 | 2 |
| LQ1 | 1 | 2 | 9 | 4 | 5 | 3 |
| CQ1 | 2 | 5 | 6 | 5 | 3 | 4 |
| CQ2 | 2 | 4 | 7 | 7 | 1 | 4 |
| CQ4 | 2 | 6 | 8 | 5 | 0 | 4 |
| CQ14 | 2 | 1 | 3 | 8 | 2 | 9 |
| DQ1 | 2 | 11 | 9 | 3 | 0 | 0 |
| EQ2 | 2 | 18 | 3 | 2 | 0 | 0 |
| EQ26 | 2 | 2 | 3 | 4 | 9 | 5 |
| KQ1 | 2 | 18 | 2 | 3 | 0 | 0 |
| KQ2 | 2 | 17 | 1 | 5 | 0 | 0 |
| LQ2 | 2 | 14 | 3 | 6 | 0 | 0 |
| LQ3 | 2 | 14 | 7 | 2 | 0 | 0 |
| CQ3 | 3 | 2 | 10 | 6 | 0 | 5 |
| CQ7 | 3 | 8 | 4 | 4 | 6 | 1 |
| CQ9 | 3 | 2 | 8 | 7 | 4 | 2 |
| CQ11 | 3 | 1 | 6 | 8 | 6 | 2 |
| DQ2 | 3 | 8 | 10 | 4 | 1 | 0 |
| DQ3 | 3 | 3 | 7 | 11 | 1 | 1 |
| DQ4 | 3 | 3 | 5 | 11 | 3 | 1 |
| DQ8 | 3 | 2 | 7 | 12 | 1 | 1 |
| DQ9 | 3 | 1 | 8 | 10 | 3 | 1 |
| DQ13 | 3 | 1 | 7 | 9 | 5 | 1 |
| EQ3 | 3 | 1 | 8 | 9 | 2 | 3 |
| EQ4 | 3 | 3 | 4 | 11 | 1 | 4 |
| EQ5 | 3 | 4 | 8 | 8 | 1 | 2 |
| EQ6 | 3 | 2 | 7 | 11 | 1 | 2 |
| EQ7 | 3 | 2 | 4 | 9 | 3 | 5 |
| EQ10 | 3 | 1 | 3 | 8 | 7 | 4 |
| EQ14 | 3 | 2 | 3 | 8 | 4 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| EQ18 | 3 | 1 | 5 | 10 | 5 | 2 |
| EQ20 | 3 | 1 | 5 | 9 | 6 | 2 |
| EQ23 | 3 | 0 | 3 | 10 | 8 | 2 |
| EQ25 | 3 | 2 | 3 | 9 | 6 | 3 |
| EQ27 | 3 | 1 | 2 | 8 | 7 | 5 |
| KQ3 | 3 | 4 | 8 | 9 | 2 | 0 |
| KQ4 | 3 | 4 | 6 | 11 | 1 | 1 |
| KQ5 | 3 | 6 | 9 | 6 | 2 | 0 |
| KQ6 | 3 | 2 | 9 | 9 | 1 | 2 |
| KQ9 | 3 | 1 | 6 | 12 | 2 | 2 |
| KQ12 | 3 | 1 | 7 | 11 | 2 | 2 |
| KQ16 | 3 | 5 | 6 | 10 | 1 | 1 |
| LQ4 | 3 | 3 | 5 | 7 | 6 | 2 |
| LQ5 | 3 | 0 | 4 | 10 | 3 | 6 |
| LQ6 | 3 | 0 | 3 | 10 | 4 | 6 |
| LQ7 | 3 | 0 | 5 | 12 | 1 | 5 |
| LQ8 | 3 | 0 | 4 | 10 | 3 | 6 |
| LQ11 | 3 | 0 | 3 | 10 | 5 | 5 |
| LQ14 | 3 | 1 | 4 | 8 | 4 | 6 |
| LQ16 | 3 | 4 | 5 | 8 | 2 | 4 |
| LQ18 | 3 | 2 | 4 | 10 | 2 | 5 |
| LQ20 | 3 | 3 | 5 | 9 | 3 | 3 |