
PKD Board Annual Report 2021**PKD Board Discussion Paper**

Forwarded by: 2021 Chairperson

Reference Document(s): B-Pub/65 - PKD Board Annual Report 2020 dated 29.01.2021

BACKGROUND

The MoU, Attachment C, paragraph 1.2 states the following:

"1.2 The PKD Board is the standing body responsible for the ICAO PKD. Its duties will include:

...

j) submit to the Participants an Annual Report on its activities and other relevant issues in the preceding year on or before 31 October;"

PURPOSE

This Discussion Paper is intended to fulfil the MoU requirement.

URGENCY

This report should be considered by the Board through written procedure in order to allow for publication on the ICAO public website in a timely manner.

PROPOSAL**PKD Board Annual Report 2021****Foreword**

The PKD Board and the entire PKD community regrets the passing of Mr. David Philp, representative of New Zealand on the PKD Board and Executive member of the PKD Executive Body, in November 2021. David was a pillar of the PKD community ever since the system was established in 2007. We lament the loss of his knowledge and experience as well as the positive attitudes and good humour that he brought to all PKD meetings and events. We express our condolences to his family, friends and colleagues.

Purpose

Based on, and in continuation of the previous PKD Board Annual Reports, the present Annual Report gives an overview of the development of the PKD as well as important activities of the PKD Board in the year 2021.

1. PKD Organization – PKD Board and Executive Body Meetings**a) PKD Board**

The 28th meeting of the PKD Board took place in Amsterdam, the Netherlands on 27 and 28 October 2021. Due to the continuing restrictions around travel to and from some destinations arising from the COVID-19 pandemic, the meeting was held in a hybrid format. A variety of organizational, technical and financial matters were discussed and

decisions made regarding update of PKD services, application of user fees and enhancement of capacity building efforts.

During the meeting, it was agreed that Mr. Mario Wiesen (Luxembourg) would be the 2022 PKD Board Chairperson and that Mr. Cor de Jonge (Netherlands) would be the 2022 PKD Board Vice-Chairperson.

Representatives of China, France, Netherlands, Singapore and Spain were nominated by the Board to occupy the five vacancies arising from the ending of Board terms. The ICAO Council approved this proposal on 22 December 2021.

b) Executive Body

Due to the COVID-19 pandemic and associated limitations on travelling and meeting in person in many jurisdictions, the Executive Body (EB) convened a series of virtual focus sessions using online video conferencing rather than meeting in person through 2021. A formal meeting of the group was convened virtually on 23 June 2021. It considered updates to PKD services in the domain of health-related certificates, the Data Quality Coach initiative and the PKD private sector use pilot and ensured coordination of preparations for the 28th Board meeting.

During the 28th meeting, the PKD Board approved an update of the Rules of Procedure for the Board to clarify that a new Executive member should be elected in the case that an existing member is elected as Chairperson or Vice Chairperson during his/her term. As Mr. Cor de Jonge (Netherlands) had been elected as Vice Chairperson during his term as an Executive Member, his position on the Executive Body became available. The term of the Swiss representative expired at the time of the meeting, opening up a second vacancy for election. The Board selected representatives of Canada and Switzerland to the PKD Executive Body for two-year terms. They joined the representative of New Zealand and the Chair and Deputy Chair of the Board as PKD Executive Body members.

The representative of New Zealand on the Executive Body, Mr. David Philp, passed away in November 2021, shortly after the Board meeting. In accordance with the PKD Board Rules of Procedure, a new Executive member will be elected at the next PKD Board meeting.

2. PKD Administration

a) Membership Fees

The fees for 2021 were approved by the PKD Board to consist of an ICAO fee of US\$ 7,032 and an operator fee of US \$19,250, thus totaling US\$ 26,282 (compared to US\$ 28,515.71 in 2020). The annual fee decreased in 2021 relative to previous years based on cost sharing amongst an increased number of members compared to previously. This was despite the incorporation of payment for extended operational support from the PKD operator into the ICAO fee budget as per the decision of the Board at its 26th meeting which led to an increase in the ICAO portion of the fee; this additional cost was more than offset by decreased operator fees associated with increased membership. As per the PKD operational contract signed in April 2016, the PKD operator fee decreases as the number of PKD participants increases and such participants become active, as per Table 1. In 2021, the operator fee decreased from US\$ 22,500 to US\$ 19,250.

55 Participants	USD 24 500
60 Participants	USD 22 500
65 Participants	USD 20 900
70 Participants	USD 19 250
75 Participants	USD 18 000

Table 1. Operator fees for the ICAO PKD system relative to the number of active PKD participants

b) Operational contract

An amendment to the existing contract with the PKD operator that extended its terms for an additional five years (i.e. to April 2026) was signed by ICAO and the operator in March 2022. The amendment had been approved by the Board during its 2020 meeting following recommendations made by the Contract Support Group and the Executive Body. The amendment also included additional provisions related to hardware renewal and system evolution and change management in the period from April 2021 to 2026 and requested execution of the change requests necessary for deprecation of the non-conformant branch of the system (see below).

c) PKD Standards and Recommended Practices (SARPs)

Amendment 28 to the International Standards and Recommended Practices, Facilitation (Annex 9 to the Convention on International Civil Aviation) was adopted by the Council at the Tenth Meeting of its 220th Session on 23 June 2020 and became applicable on 28 February 2021. The amendment introduced a new standard 3.9.2 related to the ICAO PKD:

3.9.2. Contracting States that participate in the ICAO PKD shall upload the public key data necessary for authentication of all electronic passports that they issue to the PKD.

Note.—The provision of the Contracting State’s Country-Signing Public Key Certificate Authority Certificates (CSCA) at the time of first use is considered the minimum level of data provision sufficient to fulfil this standard. Upload of certificate revocation lists (CRLs) is highly recommended.

3. Technology, System Maintenance and Evolution

The PKD system remained stable and ran without notable issue throughout 2021. It was 100% available for the whole calendar year, with no unplanned downtime in the period. All operations were achieved within Service Level Agreements. The annual configuration audit was completed successfully.

a) Deprecation of the non-conformant branch of the PKD

The operator implemented change requests 6 and 10 to the PKD following the approval by the Board and the inclusion of instructions for such in the amendment to the existing contract signed in March 2021. The change requests deprecated the non-conformant branch of the PKD so that all data uploaded by States is now, pending manual acceptance where required, included in the same (“conformant data”) branch of the system, while introducing a new `pkdConformancePolicy` value to PKD data objects to assist States with their assessment of object conformance according to their own procedures. The changes reduced centralized PKD activity as an arbiter of technical specifications and instead gives the capacity to States to incorporate PKD data within their own repositories and systems according to their own needs and technical arrangements. The pre-production deployment was formally accepted on 27 July 2021 and the deployment in the production environment completed on 23 August 2021.

Documentation was updated in line with the new system architecture through 2021, including the ICAO PKD Procedures for Participants and the PKD Interface Specifications.

b) ICAO CSCA Master List

The ICAO CSCA Master List first published on 3 March 2020 continued to grow through 2021. Thirty-nine key import ceremonies were completed in 2021, a significant increase on previous years. The Master List available online and through the ICAO PKD at the end of 2021 contained 331 certificates from 65 different document-issuing entities.

c) Expanding the PKD – Barcode signer certificates, the PKD Health Branch and the ICAO Health Master List

At the 26th meeting of the Board, inclusion of barcode signer certificates associated with Visible Digital Seals (VDS) in the ICAO PKD was approved. The Board provided a mandate to the Executive Body to define further work in order to realize such use.

The COVID-19 pandemic and the increasing use of digitally-signed health proofs for travel during the pandemic added additional dimensions to this work, with the Body having to consider the inclusion of CA certificate and barcode signers associated with the ICAO Visible Digital Seal for Non-Constrained environments (VDS-NC) – the ICAO-defined format for such health proofs – and potentially other PKI-based formats in the PKD. A formal request for offer for implementation of a new branch in the PKD to accommodate health-related certificates and for inclusion of barcode signer certificates associated with the VDS in the existing branch was submitted to the operator in July 2021. The operator presented its offer at the 28th meeting of the PKD Board. The Board, however, did not approve implementation in accordance with the offer. A technical group has been constituted to further explore this matter moving forward and continues to meet through early 2022.

The Board approved, as an interim measure, the establishment of a new ICAO Health Master List to be published on the ICAO PKD website following an offer made by the Luxembourg State Agency INCERT to support ICAO with such an initiative. The Master List should include CA certificates associated with health proofs of any form. As per rules approved by the PKD Board, all States can include certificates into this health master list, irrespective of one’s PKD participation status. The initiative was set to launch at the beginning of 2022 following conclusion of all necessary technical and administrative steps.

The ICAO Health Master List is signed under a new ICAO CA established for this purpose.

d) Private sector use of PKD data

A new pilot project authorizing private sector entities with whom an appropriate legal agreement has been signed to use the data from the ICAO PKD within their products and services was launched in December 2021. Agreements were signed with eleven companies in the first phase of the project, with each being authorized to use the data for a period of six months. Participation in the project is free of charge for companies and open to all, subject to approval of the PKD Board and checks against UN embargo lists.

The launch of this pilot project follows initial discussions on this matter that started in the 2017 meeting of the PKD Board. Permitting more flexible use of PKD data by private sector entities (hitherto use was only allowed for research, training or similar purposes) is intended to support future use of the Digital travel Credential, to support verification of electronic documents such as health proofs and to provide for more flexibility in the agile adoption of new solutions in times of challenge.

In May/June 2022, feedback will be obtained from all participating companies in a coordinated manner so that the PKD governance bodies can make more informed decisions on next steps with private sector PKD data use moving forward.

e) Participation / PKD Usage

In the course of 2021, seven new PKD Participants were welcomed. Specifically, Ghana, Lesotho, Mexico, Mongolia, Nepal, Sudan and Viet Nam joined the PKD.

Together with Australia, New Zealand, the United States, Canada, the United Kingdom, Japan, Singapore, Germany, Republic of Korea, France, China, Kazakhstan, India, Nigeria, Switzerland, Ukraine, Latvia, the Czech Republic, Macao/China, the United Arab Emirates, Hong Kong/China, Slovakia, the Netherlands, Morocco, Austria, Hungary, Norway, Bulgaria, Luxembourg, Sweden, United Nations, Spain, the Russian Federation, Malaysia, Argentina, Thailand, Ireland, Moldova, Belgium, Brazil, Qatar, Seychelles, Uzbekistan, Philippines, Iran, Colombia, Romania, Finland, Benin, Botswana, Kuwait, Georgia, Turkey, Iceland, Oman, Turkmenistan, Peru, Barbados, Panama, the European Union, Mali, Cote d'Ivoire, Serbia, Belarus, Bosnia and Herzegovina, Croatia, Egypt, Indonesia, Italy, the United Republic of Tanzania, Uganda, Bangladesh, Togo, Ecuador and Rwanda, there were 82 PKD Participants at the end of 2021.

The contents of the PKD also continuously grow as participants continue to upload their relevant data. Table 2 shows PKD contents in the final three months of 2021.

	Certificates	CRLs	CSCA Master Lists
October 2021	16 442	47	16
November 2021	16 588	47	16
December 2021	16 766	49	17

Table 2. Contents of the PKD repository at the end of 2021**f) Capacity Building**

The PKD Board approved the rollout of the PKD Data Quality Coach initiative at its 2020 meeting. The initiative foresees establishment of a mentoring relationship between an experienced coach from the PKD community and newer participants with a view to accelerating their journey towards full and proper use of the PKD in the context of wider State eMRTD issuance and verification processes.

Through 2021, a roster of coaches was assembled following an open call to the PKD membership, comprising coaches from different regions and with different language capabilities but all with significant experience in matters relating to PKI. A call was also issued to States to put forward their candidature for receiving coaching as part of the program. The PKD Executive Body selected both the coaches and the recipient countries following criteria established by the Board in their decision on the program.

Mongolia became the first recipient of the coaching program and selected the coach from Luxembourg. The mentorship relationship began in December 2021 and is anticipated to last for 12 months.

ICAO also launched a project to develop a cost-benefit analysis tool for Automated Border Control in Q4 2021 that should conclude in Q1 2022, supported by the Government of Canada. The tool is being developed with the Central America and Caribbean region especially in mind but should be widely applicable internationally. As usage of public key certificates is an important enabler of usage of ABC systems, increased rollout of PKD systems in a prudent and evidence-based manner, as can be facilitated through use of the tool, may lead to increased interest in participation in the PKD in the coming years.

4. Meetings and Events

The Secretariat updated the New Technologies Working Group on developments in the PKD at its online meeting of 14 June 2021. The new private sector data use initiative and developments regarding the inclusion of health information in the PKD were emphasized.

The Secretariat and Executive Body members also participated in a number of meetings focussed on establishing interoperability between the VDS-NC and the EU DCC. The Secretariat and the Chair of the Board represented ICAO in a dedicated interconnection group established under this framework to examine possibilities for interactions between the EU Gateway for sharing EU PKI certificates and the ICAO PKD. The work resulted in agreement on a mechanism for the EU sharing certificates with the ICAO PKD and the publication of the ICAO Health Master List to facilitate more convenient recognition of the DCC internationally in States that are not part of the EU framework. Practical realization of these arrangements should be sought in 2022.

The Chairperson of the PKD Board delivered a presentation on the PKD and the ICAO Master List at the 16th ICAO TRIP Symposium (25-27 May 2021). ICAO Council members took note of the new developments in the PKD and congratulated the PKD community for their success in developing the PKD. The President of the Council indicated the group's willingness to support further development of the PKD.

The PKD was a subject of discussion within the Facilitation Stream of the ICAO High Level Conference on COVID-19 (HLCC) which ran from 14 October to 21 October 2021. The importance of leveraging established trust mechanisms, particularly public key infrastructure, to secure issuance of health proofs was recognized, with the PKD being noted as an important facilitator of international PKI of great relevance in this domain.

5. Publications/Media

The ICAO PKD promotional video, kindly developed by the Luxembourg authorities, was made available through the ICAO YouTube channel and ICAO TV in March 2021, enhancing general awareness of the PKD in public channels. An interview with the 2020 Chair and Deputy Chair of the PKD Board, recorded in late 2020, was also made available through the ICAO TV platform in early 2021.

Conclusion

The ICAO Public Key Directory continued to advance through 2021, with more countries choosing to participate in the system and gaining increasing benefits based on the provision of new services and the availability of comprehensive capacity building to support their optimal use of the system.

Compared to 2020 when restrictions associated with the COVID-19 pandemic hindered development somewhat, new procedures and revised approaches allowed a notable recovery in activities in 2021 – significantly more PKD key import ceremonies were organized compared to 2020, for example. It was also possible to organize a meeting of the Board in hybrid format, allowing for more seamless and convenient discussion on a number of developmental topics related to the PKD. Possibilities to deliver new services to support aviation recovery's from the COVID-10 pandemic were also identified and actions taken to successfully realize them. In particular, the timely launch of the ICAO Health Master List and a pilot project examining private sector access to the PKD have been possible based on agile implementation and leveraging the resources of the wider PKD community. These initiatives should deliver significant value moving forward and set the stage for further evolution of products and services in years to come.

The Chairperson and the Board look forward to continued enhancement of service provided to participants through the PKD and further enlargement of an active PKD community in the coming years.

Mr. Mario Wiesen
2021 Chairperson
(on behalf of the ICAO PKD Board)

19 April 2022
