The Printer Working Group

PWG May 2024 Face-to-Face
Plenary Session

Jeremy Leber, PWG Chair
May 7, 2024

Plenary Agenda

- **Please Note: This PWG Meeting is Being Recorded**

- Administrivia

- PWG Steering Committee Updates

- PWG Workgroup Status [WG Chairs]

- Liaison Status

- Questions / Next Meeting / Any Other Business

Administrivia

- Welcome and Introductions
- Confirm Minutes Taker
- Review PWG Antitrust Policy, PWG IP Policy and Inappropriate Topics
- Agenda

PWG Antitrust Policy

- "This meeting is being held in accordance with the PWG Antitrust Policy"
  - https://www.pwg.org/chair/membership_docs/pwg-antitrust-policy.pdf

- The IEEE-ISTO Printer Working Group ("PWG") will not become involved in the business decisions of its Members. The PWG strictly complies with applicable antitrust laws. Every PWG Member shall comply with this policy. The PWG Officers and PWG Workgroup Officers are responsible to ensure that this policy is adhered to in all PWG activities.

PWG IP Policy

- "This meeting is being held in accordance with the PWG Intellectual Property Policy"
  - https://www.pwg.org/chair/membership_docs/pwg-ip-policy.pdf

- TL;DR: Anything you say in a PWG meeting or email to a PWG address can be used in a PWG standard
  - (but please do read the IP policy above if you haven't done so)

PWG Patent Statement

PWG standards may include the known use of essential patents and patent applications provided the PWG Chair receives assurance from the patent holder or applicant with respect to patents whose infringement is, or in the case of patent applications, potential future infringement the applicant asserts will be, unavoidable in a compliant implementation of either mandatory or optional portions of the standard. This assurance shall be provided without coercion.

PWG Patent Statement

This assurance shall be either:

- A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement either mandatory or optional portions of the proposed PWG standard against any person or entity complying with the standard; or

- A statement that a license for such implementation will be made available without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination.

PWG Patent Statement

The PWG is not in a position to give authoritative or comprehensive information about evidence, validity or scope of patents or similar rights, but it is desirable that any available information should be disclosed. Therefore, all PWG members shall, from the outset, draw PWG's attention to any relevant patents either their own or of other organizations including their Affiliates that are known to the PWG members or any of their Affiliates, although PWG is unable to verify the validity of any such information.

Inappropriate Topics for PWG Working Group Meetings

Do Not Discuss:
- Validity or essentiality of patents or patent claims
- Cost of specific patent use
- Licensing terms or conditions
- Product pricing, territorial restrictions, or market share
- Ongoing litigation or threatened litigation

<u>DO raise an objection</u> if inappropriate topics are discussed

(All times Eastern Daylight Time)

Tuesday, May 7

12:45 – 1:45	PWG Plenary
1:45 – 2:15	IPP WG: Status / Charter / IPP OAuth Extensions v1.0
2:15 – 2:45	Break
2:45 – 3:30	IPP WG: 3D Printing Liaisons / Status & Guidance
3:30 – 5:00	IPP WG: IPP System Service v1.1 / IPP Shared Infrastructure Extensions v1.1

Agenda Overview – PWG Day 2

(All times Eastern Daylight Time)

Wednesday, May 8

10:00 – 12:00	IDS WG: Status & Discussion / Liaison Status / PWG Hardcopy Device Security Guidelines v1.0
12:00 – 12:45	Break / Lunch
12:45 – 1:15	IPP WG: Strong Device Identity BoF
1:15 – 2:45	IPP WG: IPP Everywhere v2.0
2:45 – 3:00	IPP WG: Next Steps

The Printer Working Group

Steering Committee Updates

Officers (2023-2025 Term)

- PWG Chair: Jeremy Leber, Lexmark

- PWG Vice Chair: Smith Kennedy, HP Inc.

- PWG Secretary: Ira McDonald, High North

Those interested in serving in PWG Officer roles should contact chair@pwg.org.

2024 Membership

28 Members

Alan Sukert	**EPSON** Epson	**KONICA MINOLTA** Konica Minolta	**OKI** PRINTING SOLUTIONS Oki Electric Industry Co., Ltd	Technical Interface Consulting
Apple Inc.	**fiery** Fiery, LLC	**KYOCERA** Kyocera	**PaperCut** PaperCut Software	**TOSHIBA** Leading Innovation >>> Toshiba Business Solutions
brother at your side Brother Industries, Ltd.	**FUJIFILM** FUJIFILM Business Innovation Corp.	Lakeside Robotics Lakeside Robotics	**Printer**Logic a VASION solution PrinterLogic	**TCS** Tykodi Consulting Services LLC. Tykodi Consulting Services LLC
Canon Canon	**Google** Google	**Lexmark** Lexmark	**Qualcomm** Qualcomm	**xerox** Xerox
Danny Brennan	High North Inc High North, Inc.	**meteor** network Meteor Network	**RICOH** Ricoh	
DIGITAL CHECK Digital Check Corp	**hp** HP Inc.	**Microsoft** Microsoft	**Synaptics** Synaptics	

Thank You For Participating!

Thanks to all of you for contributing your time and efforts to the PWG!

Future Meeting Schedule

2024

- August 6-8 – Virtual

- November 12 -14 - Virtual

2025

- February 4-6 – Virtual

- May 6-8 – Joint w/OP (real or virtual?)

- August 12-14 – Virtual

- November 11-13 - Virtual

Contact chair@pwg.org if you are interested in hosting a PWG F2F event

IPP Everywhere™ Certified Printers

- https://www.pwg.org/ipp/everywhere.html

- **1304** printers now certified!
  - https://www.pwg.org/printers/
  - New printers from Canon, Digital Check, OKI, HP, Lexmark, Ricoh, and Samsung
  - **More on the way!**

- IPP Everywhere™ Self Certification 1.1 Update 4
  - → Announced Sept. 2, 2022
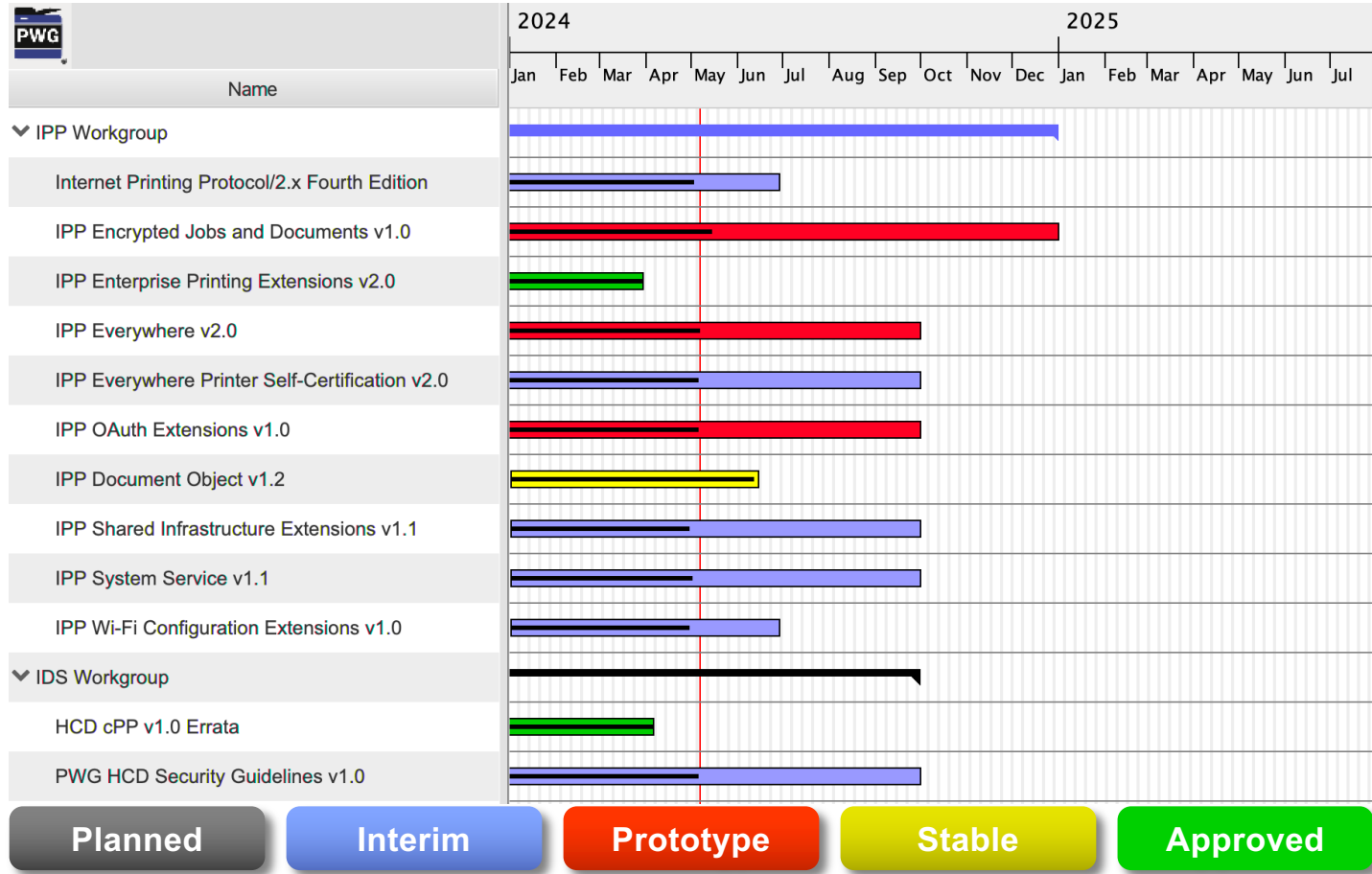 - → **IPP Everywhere v1.0 Certifications no longer accepted**

Projects on GitHub

- PWG on GitHub:
  - https://github.com/istopwg

- IPP Sample Code
  - https://github.com/istopwg/ippsample

- IPP Everywhere Self Certification Tools
  - https://github.com/istopwg/ippeveselfcert

- IPP Registry
  - https://github.com/istopwg/ippregistry

- PWG Books:
  - https://github.com/istopwg/pwg-books

The Printer Working Group

Workgroup Status

Work in Progress

Name	2024	2025

IPP Workgroup
- Internet Printing Protocol/2.x Fourth Edition
- IPP Encrypted Jobs and Documents v1.0
- IPP Enterprise Printing Extensions v2.0
- IPP Everywhere v2.0
- IPP Everywhere Printer Self-Certification v2.0
- IPP OAuth Extensions v1.0
- IPP Document Object v1.2
- IPP Shared Infrastructure Extensions v1.1
- IPP System Service v1.1
- IPP Wi-Fi Configuration Extensions v1.0

IDS Workgroup
- HCD cPP v1.0 Errata
- PWG HCD Security Guidelines v1.0

Planned · **Interim** · **Prototype** · **Stable** · **Approved**

IDS Workgroup Status

Alan Sukert

IDS WG: Officers

- **IDS WG Chair:**
  - Alan Sukert
- **IDS WG Vice-Chair**
  - TBD
- **IDS WG Secretary:**
  - Alan Sukert
- **IDS WG Document Editors:**
  - Ira – HCD Security Guidelines

IDS: Current Status

- IDS activities include:
  - Updating PWG members on activities related to:
    - Common Criteria Hard Copy Device (HCD) Protection Profiles (PPs) and the HCD international Technical Community (iTC)
    - Security Developments affecting Hard Copy Devices and Services in other organizations including the Trusted Computing Group (TCG) and Internet Engineering Task Force (IETF),
  - Developing HCD Security Guidelines to provide guidance on current HCD security technology and security issues
- Individual IDS Working Group Sessions have now restarted with the IDS Session at the May PWG Virtual Face-to-Face

IDS: Current Status

- HCD international Technical Committee (iTC):
  - Since the publishing of HCD cPP v1.0 and HCD SD 1.0 on 10/31/22, the HCD iTC holds HCD iTC Meetings once every month
  - Will discuss the current status of the HCD iTC, the status of the HCD Interpretation Team (HIT) and plans for future updates to the published HCD cPP and HCD SD at the IDS F2F Session on Wednesday, May 9th
- Developing HCD Security Guidelines to provide guidance on current HCD security technology and security issues
  - Will review the latest status at the IDS F2F session
- IDS F2F Session will have a special topic on the Implementing Regulation for the EU Common Criteria (EUCC)
- IDS F2F Session will review current status of HCD-related standards efforts of the Trusted Computing Group (TCG) and Internet Engineering Task Force (IETF)

- We welcome participation from all interested parties
- IDS Working Group web page
  - https://www.pwg.org/ids/
- Subscribe to the IDS mailing list
  - https://www.pwg.org/mailman/listinfo/ids
- IDS WG holds bi-weekly meetings via WebEx announced on the IDS mailing list
  - Next meeting is scheduled for Thursday, May 30, 2024 at 3pm EDT

![The Printer Working Group logo — PWG]

The Printer Working Group

IPP Workgroup Status

Paul Tykodi (TCS), Ira McDonald (High North), Michael Sweet (Lakeside Robotics)

IPP WG: Officers

- **IPP WG Co-Chairs:**
  - Paul Tykodi (TCS)
  - Ira McDonald (High North)
- **IPP WG Secretary:**
  - Michael Sweet (Lakeside Robotics)
- **IPP WG Document Editors:**
  - Michael Sweet (Lakeside Robotics) – Internet Printing Protocol/2.x Fourth Edition, IPP Document Object v1.2, IPP Encrypted Jobs and Documents v1.0, IPP Everywhere v2.0, IPP Everywhere Printer Self-Certification Manual v2.0, IPP OAuth Extensions v1.0, IPP Shared Infrastructure Extensions v1.1, IPP System Service v1.1, IPP Wi-Fi Configuration Extensions v1.0
  - Smith Kennedy (HP Inc.) – IPP Encrypted Jobs and Documents v1.0, IPP Enterprise Printing Extensions v2.0

IPP WG: Status

- PWG Specifications in development:
  - Internet Printing Protocol/2.x Fourth Edition (Interim)
  - IPP Document Object v1.2 (Interim)
  - IPP Encrypted Jobs and Documents v1.0 (Prototype)
  - IPP Enterprise Printing Extensions v2.0 (Completed PWG Last Call)
  - IPP Everywhere™ v2.0 (Prototype)
  - IPP Everywhere™ Printer Self-Certification Manual v2.0 (Interim)
  - IPP OAuth Extensions v1.0 (Prototype)
  - IPP Shared Infrastructure Extensions v1.1 (Interim)
  - IPP System Service v1.1 (Interim)
- Recently approved:
  - PWG 5100.3-2023: IPP Production Printing Extensions v2.0 (PPX)
  - PWG 5100.7-2023: IPP Job Extensions v2.1 (JOBEXT)
  - PWG 5100.13-2023: IPP Driver Replacement Extensions v2.0 (NODRIVER)
  - PWG 5101.1-2023: PWG Media Standardized Names v2.1 (MSN)
- Up-to-date pending IANA registrations online:
  - https://www.pwg.org/ipp/ipp-registrations.xml

IPP WG: More Information

- We welcome participation from all interested parties
- IPP workgroup web page
  - https://www.pwg.org/ipp/index.html
- Subscribe to the IPP mailing list
  - https://www.pwg.org/mailman/listinfo/ipp
- IPP WG holds bi-weekly phone conferences announced on the IPP mailing list
  - Next conference calls scheduled for Thursday, May 23 and June 6, 2024 at 3pm ET

The Printer Working Group

Liaison Status – May 2024

Covered in the OpenPrinting Plenary on Monday, May 6, and throughout the other OpenPrinting sessions.

Mopria Alliance

- Anthony Suarez (Kyocera): Mopria Alliance liaison to PWG

- Smith Kennedy (HP Inc.): PWG liaison to Mopria Alliance

- PWG presented "Recent Significant Changes to IPP" at Mopria Member Meeting November 9, 2023

- No active collaboration efforts but opportunities exist

3MF Consortium

- Duann Scott (Bits to Atoms) is the Executive Director of the 3MF Consortium
- Mike Sweet (Lakeside Robotics) is the PWG liaison to the 3MF
- No updates since the February 2024 virtual Face-to-Face meeting

3D / Additive Manufacturing Liaisons

- American Concrete Institute Committee 564 - 3-D Printing with Cementitious Materials
    - https://www.concrete.org/committees/directoryofcommittees/acommitteehome.aspx?committe e_code=C0056400
        - Paul Tykodi is updating PWG presentation slides from fall 2019.
        - PWG steering committee has determined that the most efficient way to deliver information about the relevance of PWG Safe G-code, in the preparation of 3D Concrete Printing test files, is for Paul Tykodi to prepare a training video on the subject and make the resulting video file available from the PWG Web site.

- ASTM Summary of 3D Concrete Printing Related Standards Development Through 2021
    - https://sn.astm.org/features/shape-concrete-come-ma21.html

3D / Additive Manufacturing Liaisons

- Some Standards Organizations Involved with 3D Concrete Printing

  - **AASHTO** – The American Association of State Highway and Transportation Officials
    - Transportation Infrastructure Codes & Standards
  - **ASTM Committee C01 on Cement**
    - C01.22 – Workability
  - **ASTM Committee C09 on Concrete and Concrete Aggregates**
    - C09.25 - Organic Materials for Bonding
  - **ASTM Committee F42 on Additive Manufacturing Technologies**
    - F42.07.07 - Construction
  - **The International Federation for Structural Concrete (fib)**
    - TG2.11 Structures Made by Digital Fabrication
  - **ISO Technical Committee/261 – Additive Manufacturing**
    - ISO/TC 261/JG 80 - Joint ISO/TC 261-ASTM F42 Group: Quality requirements for additive manufacturing in building & construction (structural and infrastructure elements)
  - **NIST – National Institute of Standards and Technology**
    - Data Management and Fusion for AM Industrialization
    - Infrastructure Materials Group
    - Metrology
  - **RILEM - International Union of Laboratories and Experts in Construction Materials, Systems and Structures**
    - Digital Fabrication
  - **UL Solutions**
    - UL 3401 - Outline of Investigation for 3D Printed Building Construction

3D / Additive Manufacturing Liaisons

- Opportunities for Promoting the Benefits of Using PWG Safe G-Code with 3D Concrete Printing at Conferences

  - The ASTM International Conference on Additive Manufacturing (ICAM 2024 – Oct 28-Nov 1, 2024 – Atlanta, GA) - https://amcoe.org/event/icam2024/

  - 4th RILEM International Conference on Concrete and Digital Fabrication (Digital Concrete 2024) – September 4-6th, 2024 in Munich, Germany

  - Transportation Research Board Conference on Advancing Additive Manufacturing and Construction in Transportation – November 7-8, 2024 in Irvine, CA

3D / Additive Manufacturing Liaisons

- Formnext Tradeshow Related Activities

  - **The Standards Forum** hosted by Formnext and sponsored by ASTM Center of Excellence with assistance from the US Commercial Service will occur on either the first or second day of the upcoming Formnext Tradeshow in Frankfurt, Germany

  - **Formnext Tradeshow** – November 19-22, 2024 – Frankfurt, Germany - https://formnext.mesago.com/frankfurt/en.html

  - **Formnext Chicago** – In calendar 2025, Formnext will expand into the North American marketplace by hosting an annual spring tradeshow and exhibition at McCormick Place in Chicago, IL – April 8-10, 2025 – https://www.formnextchicago.com/

  - **International Manufacturing Technology Show (IMTS 2024)** – Additive Manufacturing Sector *accelerated by formnext – As a precursor to the commencement of the annual Formnext Chicago tradeshow beginning in 2025, formnext sponsor Messe Frankfurt has partnered with the IMTS exhibition organizer to develop an Additive Manufacturing section in the IMTS exhibitor space. IMTS will take place in Chicago, IL at McCormick Place – September 9-14, 2024 – https://www.imts.com/*

3D / Additive Manufacturing Liaisons

- The ASTM International Conference on Additive Manufacturing (ICAM 2024 – Oct 28-Nov 1, 2024 – Atlanta, GA) -
  - https://amcoe.org/event/icam2024/
    - Alan Sukert chairperson of the IEEE-ISTO PWG Imaging Device Security(IDS) Workgroup participated in the **Industry 4.0: Security Aspects of AM** track within the 2023 ICAM conference. The title of his presentation was *"Developing Cyber Security Certification for the Additive Manufacturing Process"*.
    - Alan's presentation leveraged some new capabilities recently added to the Common Criteria standard, which can be used to develop Common Criteria certification for a whole digital thread workflow. The new capabilities can be used to validate some of the latest Additive Manufacturing Security efforts being undertaken by NIST.
    - The conference organizers have now extended an invitation to Alan to participate as an invited speaker at the upcoming ICAM 2024

- The PWG also has a potential opportunity to possibly co-present with one of the *Industry 4.0: Security Aspects of AM* track sponsors on how the Cybersecurity aspects of IPP can be utilized in conjunction with IPP 3D semantics to provide improved Cloud to production class 3D Printing equipment Cybersecurity controls using relatively insecure Internet based infrastructure to make the physical network connection.

3D / Additive Manufacturing Liaisons

- Opportunities to Promote PWG 3D Related Standardization Efforts that were not Pursued

- Drupa Next Age
  - https://www.drupa.com/en/Media_News/Press/Press_Material/Press_releases/drupa_next_age_Platform_for_networking_and_new_business
    - The PWG was offered a presentation slot from 12:30 to 1:15 pm on June 6th, 2024. After reviewing the benefits to the PWG of promoting its 3D related printing standards work at Drupa via a panel presentation, to the logistics and costs associated with getting Paul Tykodi from New Hampshire to Düsseldorf on relatively short notice, the PWG steering committee decided not to pursue the Drupa dna opportunity.

- TCT 3Sixty Conference
  - https://tct3sixty.com/
    - The PWG December 2023 abstract submission (Construction & Architecture - Safe G-Code for sharing test files) did not result in an offer to make a presentation.

3D / Additive Manufacturing Liaisons

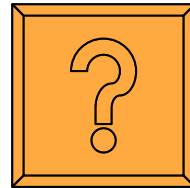- America Makes & ANSI Additive Manufacturing Standardization Collaborative (AMSC) -
  - https://www.ansi.org/standards-coordination/collaboratives-activities/additive-manufacturing-collaborative.
    - The IEEE-ISTO Printer Working Group participated in the AMSC version 3 update activities. ANSI announced publication of version 3 on July 17th, 2023.
    - The sponsor of the AMSC effort (America Makes) has recently established two new Digital Stockpile working groups. Due to the past participation of the PWG in AMSC activities, it received notification of the establishment of Working Group 2 titled **"Digital Infrastructure, Data Packages, Standards, and IP Protections"**. Paul Tykodi has subscribed to the working group mailing list to monitor the standardization efforts discussed in the working group on behalf of the PWG."
    - At the May 2023 PWG F2F, some editorial improvements impacting PWG content in the AMSC version 2 document were approved in the PWG Session titled "3D Printing Liaisons - Status & Guidance". Some of the PWG approved editorial changes did make it into the AMSC version 3 update published in July 2023 while others did not.
    - ANSI has announced that they will be accepting updated content for AMSC version 3 in the fall of 2024. Paul Tykodi plans to add the remaining approved by the PWG AMSC editorial improvement text from calendar 2023 to the AMSC version 3 document when the fall updating opportunity becomes available.

- ASTM Committee F42 on Additive Manufacturing Technologies -
  - https://www.astm.org/COMMITTEE/F42.htm

3D / Additive Manufacturing Liaisons

- VDMA OPC UA for Additive Manufacturing - Joint Working Group 40540
  - https://www.vdma.org/events-trade-fairs/-/event/view/70649
    - Paul Tykodi is representing the IEEE-ISTO Printer Working Group in the activities of the Joint Working Group. The JWG has a potential interest in referencing IPP 3D standard for secure remote job submission

- 3D PDF at the PDF Association -
  - https://www.pdfa.org/3d-pdf-at-the-pdf-association/
    - Paul Tykodi is representing the IEEE-ISTO Printer Working Group in the activities of the PDF Association 3D PDF Technical Working Group (TWG) and as time permits the 3D PDF User Liaison Working Group (LWG) as well.
      - Participation in the work of the PDF Association allows the PWG to monitor the activities of ISO TC171 SC2 - *Document file formats, EDMS systems and authenticity of information* https://www.iso.org/committee/53674.html, which is the committee responsible for PDF file format standardization
    - Current PDF Standards Supporting 3D Content
      - ISO 32000-2:2020 PDF 2.0 https://pdfa.org/resource/iso-32000-pdf/#pdf-2
      - ISO 21757 (ECMAscript for PDF) https://pdfa.org/resource/iso-21757-ecmascript/
      - ISO 14739-1:2014 PRC https://pdfa.org/resource/3d-formats/#prc-1
      - ISO/TS 24064:2023 STEP (AP242) https://www.iso.org/standard/77686.html
    - In Process PDF Standards Supporting 3D Content
      - ISO/CD TS 32007 Document management — Portable Document Format — RichMedia annotations conforming to glTF assets https://www.iso.org/standard/45880.html

Other Questions / Comments

August 6-8 – Virtual

Monitor pwg-announce@pwg.org or the PWG meeting page for more info.