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**Constellation Observing System for Meteorology,  
Ionosphere, and Climate Product Generation and  
Distribution (COSMIC-PGD) System  
Interconnection Security Agreement (ISA)**

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**Between**

**University Corporation for Atmospheric Research (UCAR) /  
Constellation Observing System for Meteorology, Ionosphere, and  
Climate Product Generation and Distribution (COSMIC-PGD)**

**and**

**National Institute for Space Research (INPE) of Brazil /  
INPE-COSMIC-PGD System**

**Version 3.0**

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## UCAR Interconnection Security Agreement

### Revision History

Version	Date	Sections	Description	Author
0.1	08/22/2017	All	Initial draft.	Jose Castilleja
0.2	12/12/2017	All	Review input from INPE.	Jose Castilleja
0.3	04/17/2018	All	Review input from INPE.	Jose Castilleja
0.4	05/12/2018	All	Added UCAR prefix to the UCAR COSMIC-PGD.	Jose Castilleja
0.5	08/23/2018	All	Accepted changes from NOAA review. Updated INPE IP addresses.	Emily Lauer
0.6	09/27/2018	All	Updated INPE ATO date. Adjusted future tense language to present tense.	Emily Lauer
1.0	12/04/2018	2.2, 2.4, 2.8, 4.0	Review input from INPE. Removed IP addresses and INPE SO as signatory. Initial version.	Emily Lauer
1.1	02/24/2022	All	ISA renewal – updated per latest guidance. Removed IPs/hostnames. UCAR contacts updated.	Emily Lauer
1.2	04/07/2022	All	INPE review and updates for location, ATO, contacts, and AO signature.	INPE
2.0	04/11/2022	All	Final version for signature.	Emily Lauer
2.1	02/18/2025	All	ISA renewal - Updates for NSF branding, COSMIC-PGD ATO, and network manager.	Emily Lauer
2.2	04/29/2025	2.8, 4.0	INPE review and updates for contacts and AO signature.	INPE
3.0	04/29/2025	All	Accepted changes. Final version.	Emily Lauer

## **1 INTERCONNECTION STATEMENT OF REQUIREMENTS**

The Constellation Observing System for Meteorology, Ionosphere, and Climate Product Generation and Distribution (COSMIC-PGD) system is a general support system owned and operated by the University Corporation for Atmospheric Research (UCAR) on behalf of the National Oceanic and Atmospheric Administration (NOAA). UCAR operates the United States National Science Foundation National Center for Atmospheric Research (NSF NCAR), a Federally Funded Research and Development Center (FFRDC).

The purpose for the interconnection between UCAR and the Brazilian National Institute for Space Research (INPE) is to exchange weather data between the COSMIC-PGD system owned by UCAR/COSMIC, and the INPE-COSMIC-PGD system owned by INPE.

## **2 SYSTEM SECURITY CONSIDERATIONS**

### **2.1 General Information/Data Description**

The COSMIC-PGD system receives radio occultation (RO) data and other RO mission level-0 telemetry data in near real-time and processes them to generate weather and space weather Environmental Data Records (EDRs). The Two-Line Element (TLE) files contain satellite ephemeris data (i.e., positioning information) used by ground stations to downlink data from the spacecraft. The Virtual Channel (VC) files contain weather data remotely measured from the satellites.

The primary COSMIC-PGD system is located in the NSF NCAR-Wyoming Supercomputing Center (NSF NWSC) in Cheyenne, Wyoming (WY). This NSF NCAR facility houses dedicated COSMIC-PGD computing equipment that is neither connected to nor utilizing the supercomputer components located at the same facility. The alternate COSMIC-PGD system is located in the NSF NCAR Mesa Lab Data Center (MLDC) in Boulder, Colorado (CO). The INPE-COSMIC-PGD system is located at INPE's Space Coordination for the Western Center (COECO) in Cuiabá, Brazil.

The interconnection between the COSMIC-PGD and INPE-COSMIC-PGD systems is a two-way communication path. The INPE-COSMIC-PGD system downlinks VC files from the spacecraft and delivers them to the COSMIC-PGD system, where the data is converted into weather product formats usable for weather forecasting. The COSMIC-PGD system in turn delivers TLE and Pass Schedule files to the INPE-COSMIC-PGD system.

### **2.2 Services Offered**

The service offered for this interconnection is File Transfer Protocol Secure (FTPS). This interconnection is for the sole purpose of data exchange between the two interconnected systems. The INPE-COSMIC-PGD system pulls TLE and Pass Schedule files from the COSMIC-PGD system over the public internet. The INPE-COSMIC-PGD system uses

this same account and connection to push VC files to the COSMIC-PGD system over the public internet.

### 2.3 Data Sensitivity/Information and System Security Categorization

No personally identifiable information (PII) or other forms of Controlled Unclassified Information (CUI) is shared between the COSMIC-PGD and INPE-COSMIC-PGD systems. Data is provided as free and open, based on international agreements (e.g., World Meteorological Organization (WMO) Resolution 40). Information types based on the National Institute of Standards and Technology (NIST) Special Publication (SP) 800-60 are listed in the following table.

Table 1 - Information Type Security Categorizations

System	NIST SP 800-60 Vol. 2 Rev. 1 Information Type	Confidentiality	Integrity	Availability
COSMIC-PGD	D.8.1: Environmental Monitoring and Forecasting	Low	Moderate	Low
INPE-COSMIC-PGD	D.8.1: Environmental Monitoring and Forecasting	Low	Moderate	Low

#### 2.3.1 Overall System Security Categorization of the COSMIC-PGD system (Confidentiality = M, Integrity = M, Availability = M)

The COSMIC-PGD system receives VC files from the INPE-COSMIC-PGD system.

The COSMIC-PGD system provides TLE and Pass Schedule files for the INPE-COSMIC-PGD system to pull.

All of the above information types have a security categorization of Confidentiality = Low, Integrity = Moderate, and Availability = Low as defined in the NIST SP 800-60 Vol. 2 Rev. 1, D.8.1 Environmental Monitoring and Forecasting Information Type.

#### 2.3.2 Overall System Security Categorization of the INPE-COSMIC-PGD system (Confidentiality = L, Integrity = M, Availability = L)

The INPE-COSMIC-PGD system pushes VC files to the COSMIC-PGD system.

The INPE-COSMIC-PGD system pulls TLE and Pass Schedule files from the COSMIC-PGD system.

All of the above information types have a security categorization of Confidentiality = Low, Integrity = Moderate, and Availability = Low as defined in the NIST SP 800-60 Vol. 2 Rev. 1, D.8.1 Environmental Monitoring and Forecasting Information Type.

## **2.4 User Community**

The purpose of this interconnection agreement is to share environmental data between the COSMIC-PGD and INPE-COSMIC-PGD systems.

All COSMIC-PGD personnel undergo background checks as part of the hiring process. Background checks for COSMIC-PGD personnel are conducted by UCAR.

All COSMIC-PGD and INPE-COSMIC-PGD personnel are required to take and pass Information Technology (IT) Security Awareness Training. The COSMIC-PGD users are required to acknowledge the UCAR Rules of Behavior (RoB) prior to being granted access to the COSMIC-PGD system, and as a part of the annual UCAR security awareness training. All INPE-COSMIC-PGD users are required to take introductory lectures on the awareness of the use of computational resources, and sign a safety standards awareness document, in order to comply with INPE's General Director Resolution (RE-DIR) 518 - Normative document for the acceptable use of computational resources.

## **2.5 Information Exchange Security**

The FTPS protocol is used to protect the credential and information exchange between the COSMIC-PGD and INPE-COSMIC-PGD systems. INPE uses a group account with a reusable password, created by UCAR/COSMIC, which allows INPE to automate the file transfer process. The account is used for the purpose of pushing VC files to the COSMIC-PGD and pulling TLE and Pass Schedule files. This account does not have the ability to elevate privilege. UCAR/COSMIC maintains the account on the COSMIC-PGD system and determines the appropriate password strength and change policy. Upon agreement and coordination between both the COSMIC-PGD and INPE-COSMIC-PGD operations staff, the FTPS interconnection may be modified in the future to utilize Secure File Transfer Protocol (SFTP) with Secure Shell (SSH) keys for authentication. The SSH keys would allow for the same automated file transfer process and privilege restrictions as the reusable password authentication over FTPS.

Both the COSMIC-PGD and INPE-COSMIC-PGD systems are located within controlled access facilities, with alarms and 24x7 monitoring. UCAR/COSMIC users access the COSMIC-PGD system over the UCAR Virtual Private Network (VPN) with multifactor authentication token. INPE users access the INPE-COSMIC-PGD system through their "login" and "password" used for accessing all of INPE's internal systems. Differentiated authentication rules are not applied. Individual COSMIC-PGD staff have no direct access to the INPE-COSMIC-PGD system. Individual INPE-COSMIC-PGD staff have no direct access to the COSMIC-PGD system.

## 2.6 Trusted Behavior Expectations

Systems administrators/engineers and IT security personnel from both systems involved in this agreement are expected to take all actions necessary to protect each other's data and systems. Planned system outages that will affect this interconnection will be coordinated sufficiently in advance to allow for the exercise of contingency plans as required. Unplanned outages will be reported to both System Owners (SO) (and their representatives) as soon as possible.

The COSMIC-PGD and INPE-COSMIC-PGD system administrators and users are expected to protect the data in accordance with the Privacy Act and Trade Secrets Act (18 U.S. code 1905) and the Unauthorized Access Act (18 U.S. Code 2701 and 2710). Any suspected security incidents will be reported to each organization's computer incident response team.

Each system will maintain an Authorization to Operate (ATO) granted by the responsible authorizing official. The COSMIC-PGD ATO is granted in accordance with the requirements of NIST SP 800-37, Rev. 2, *Risk Management Framework for Information Systems and Organizations: A System Life Cycle Approach for Security and Privacy* (December 2018). The INPE ATO is granted in accordance with INPE's RE-DIR-518.

**2.6.1** UCAR COSMIC-PGD ATO: granted 22 January 2025 and expires 14 February 2026. The COSMIC-PGD system undergoes assessment and authorization renewal annually.

**2.6.2** INPE-COSMIC-PGD ATO: valid for time not specified as INPE's RE-DIR-518.

## 2.7 Formal Security Policy

Policy documents that govern the protection of the data are listed below:

- NIST SP 800-35, *Guide to Information Technology Security Services*, October 2003.
- NIST SP 800-47, *Security Guide for Interconnecting Information Technology Systems*, August 2002.
- NIST SP 800-53, Rev. 5, *Security and Privacy Controls for Information Systems and Organizations*, September 2020 (updated December 20, 2020).
- UCAR Policies:
  - UCAR Corporate Policy 1-7, *Information Security*, October 21, 2024.
  - UCAR Corporate Policy 3-6, *Access to and Use of Information Systems and Technology Infrastructure*, January 3, 2024.
- INPE/INPE-COSMIC-PGD Policies:
  - INPE's RE-DIR-568 - Normative document for the acceptable use of computational resources.



## 2.8 Incident Reporting

The UCAR Incident Response Policy establishes the uniform policy for the COSMIC-PGD system for incident reporting and handling, and identifies the associated policies and procedures for the UCAR Cyber Incident Response Team (CIRT). This policy also establishes minimum practices to protect against, detect, respond to, and report all cyber security incidents (malicious, unintentional, successful, or unsuccessful) against UCAR systems and networks.

Report incidents or violations of this interconnection agreement and supporting policies identified above, which potentially represents a risk to the COSMIC-PGD system to the COSMIC Incident Response Team (COSMIC IRT) by calling 303-497-8040 or by email using [cosmic-sys@ucar.edu](mailto:cosmic-sys@ucar.edu) and [cosmicops@ucar.edu](mailto:cosmicops@ucar.edu). The COSMIC IRT is available 24 hours per day, seven days a week.

The INPE Incident Response Policy establishes the uniform policy for the INPE-COSMIC-PGD for incident reporting and handling. This policy also establishes minimum practices to protect against, detect, respond to, and report all cyber security incidents (malicious, unintentional, successful, or unsuccessful) against INPE systems and networks. To report incidents or violations, please contact the INPE Incident Response team at [security-inpe@inpe.br](mailto:security-inpe@inpe.br).



Table 2 - System Points of Contact

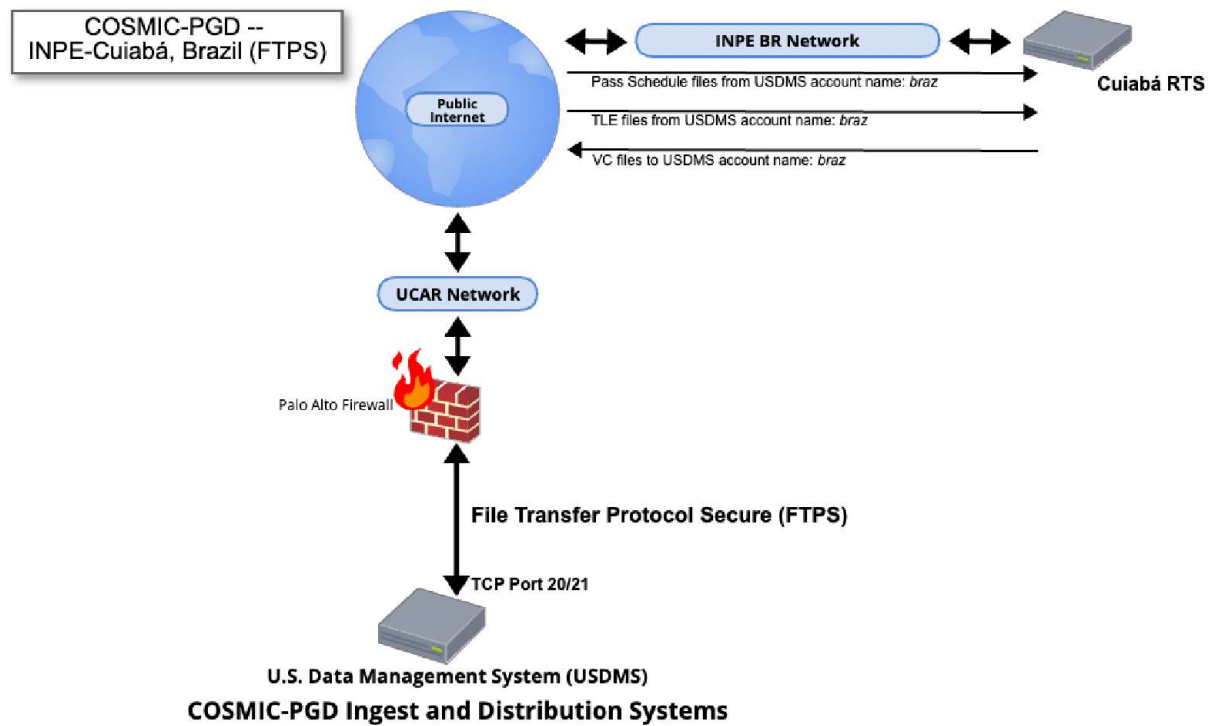
Role	UCAR COSMIC-PGD	INPE-COSMIC-PGD
<b>Incident Response Team</b>	COSMIC IT and Operations Staff 24x7 at 303-497-8040 <a href="mailto:cosmic-sys@ucar.edu">cosmic-sys@ucar.edu</a> <a href="mailto:cosmicops@ucar.edu">cosmicops@ucar.edu</a>	INPE COSMIC IT and operations staff M-F, 8AM-5PM: +55 12 3208 7878 <a href="mailto:security-inpe@inpe.br">security-inpe@inpe.br</a>
<b>System 24-Hour Contact Information</b>	303-497-8040 <a href="mailto:cosmic-sys@ucar.edu">cosmic-sys@ucar.edu</a> <a href="mailto:cosmicops@ucar.edu">cosmicops@ucar.edu</a>	Not Applicable
<b>System Owner</b>	Jan-Peter Weiss <a href="mailto:weissj@ucar.edu">weissj@ucar.edu</a> 303-497-2605	Joaquim E. Rezende Costa <a href="mailto:joaquim.costa@inpe.br">joaquim.costa@inpe.br</a> +55 12 3208 7191
<b>System Owner Representative</b>	Not Applicable	Marcelo Banik de Pádua <a href="mailto:marcelo.banik@inpe.br">marcelo.banik@inpe.br</a> +55 12 3208 7890
<b>Network Manager</b>	Gary Romero <a href="mailto:gromero@ucar.edu">gromero@ucar.edu</a> 303-497-2621	STI Gestão <a href="mailto:infra.ti@inpe.br">infra.ti@inpe.br</a> +55 12 3208 6760
<b>Information System Security Officer</b>	Emily Lauer <a href="mailto:lauer@ucar.edu">lauer@ucar.edu</a> 303-497-2652	STI Gestão <a href="mailto:infra.ti@inpe.br">infra.ti@inpe.br</a> +55 12 3208 6760

## 2.9 Audit Trail Responsibilities

COSMIC-PGD staff review logs pertaining to INPE-COSMIC-PGD on a weekly basis. The methods consist of cron jobs run on the main entry point for INPE-COSMIC-PGD. These cron jobs parse the log files for access from INPE-COSMIC-PGD then send an email to the COSMIC-PGD Information System Security Officer (ISSO) for review. Audit logs are retained for a minimum of three (3) months.

INPE collects logs pertaining to COSMIC-PGD and audits them only in cases of security incidents. Audit logs are retained for a minimum of three (3) months.

### 3 TOPOLOGICAL DRAWING



#### 4 SIGNATORY AUTHORITY

We have read and understand the terms of this ISA and will ensure compliance with requirements documented within. This ISA is valid for three (3) years after the last date of the signatures below. At that time, it will be updated, reviewed, and reauthorized. Either party may terminate this agreement upon 180 days' advance notice in writing or in the event of a security incident that necessitates an immediate response. We further understand that noncompliance on the part of either UCAR/COSMIC-PGD or INPE/INPE-COSMIC-PGD or its users or contractors with regards to information security policies, standards, and procedures explained herein may result in the immediate termination of this agreement.

**COSMIC-PGD co-Authorizing Official  
(co-AO) and Director of UCAR  
Community Programs (UCP)**

William Kuo

DocuSigned by:

Bill Kuo

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4/29/2025

Signature

Date

**INPE Authorizing Official (AO) and  
Director**

Antonio Miguel Vieira Monteiro

Assinado por:

Antonio Miguel Vieira Monteiro

8A1AFE2774344B5...

4/30/2025

Signature

Date

**COSMIC-PGD co-AO and UCAR Chief  
Information Officer (CIO)**

Gregory Madden

DocuSigned by:

Greg Madden

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4/29/2025

Signature

Date

**COSMIC-PGD System Owner (SO) and  
Director of the COSMIC Program**

Jan-Peter Weiss

DocuSigned by:

Jan-Peter Weiss

19FF9F7A85974E8...

4/29/2025

Signature

Date