



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

Between

**Constellation Observing System for Meteorology,
Ionosphere, and Climate Product Generation and Distribution
(COSMIC-PGD) (NOAA5049)**

and

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

Version 1.0

December 4, 2018

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UCAR Interconnection Security Agreement

Record of Changes/Revisions

Change/Version Number	Date of Change	Sections Changed	Description	Person Entering Change
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 INTERCONNECTION STATEMENT OF REQUIREMENTS

The Constellation Observing System for Meteorology Ionosphere and Climate Product Generation and Distribution (COSMIC-PGD) system is a major application owned and operated by the University Corporation for Atmospheric Research (UCAR), a Federally Funded Research and Development Corporation (FFRDC) sponsored by the National Science Foundation (NSF) on behalf of the National Oceanic and Atmospheric Administration (NOAA). The purpose for the interconnection between UCAR and the Brazilian National Institute for Space Research (INPE) is to exchange weather data between the UCAR COSMIC-PGD system owned by UCAR/COSMIC, and the INPE Constellation Observing System for Meteorology Ionosphere and Climate Product Generation and Distribution system (INPE-COSMIC-PGD), owned by INPE.

2 SYSTEM SECURITY CONSIDERATIONS

2.1 General Information/Data Description

The interconnection between the UCAR COSMIC-PGD Data Management System (DMS) and INPE-COSMIC-PGD is a two-way communication path. The INPE-COSMIC-PGD system downlinks Virtual Channel (VC) files from the COSMIC spacecraft and sends it to the UCAR COSMIC-PGD system where the data is converted into weather product formats usable for weather forecasting. The UCAR COSMIC-PGD system in turn provides Two-Line Element (TLE) and Pass Schedule files to the INPE-COSMIC-PGD system.

The UCAR COSMIC-PGD receives radio occultation (RO) data and other RO mission level-0 data in near real-time and processes these to generate weather and space weather environmental data records (EDRs). TLE files contain satellite ephemeris data (i.e., positioning information) used by Ground Stations to be able to downlink data. VC files contain weather data, remotely measured from the satellites. The primary UCAR COSMIC-PGD system is located in the National Center for Atmospheric Research (NCAR) Wyoming Supercomputing Center (NWSC) in Cheyenne, Wyoming (WY). The backup system is located in the UCAR Mesa Lab Data Center (MLDC) in Boulder, Colorado (CO).

2.2 Services Offered

The service offered for this interconnection is File Transfer Protocol over SSL (FTPS). This interconnection is for the sole purpose of data exchange between the two interconnected systems. UCAR COSMIC-PGD receives VC data products from the INPE-COSMIC-PGD system, received at `usdms-ml.cosmic.ucar.edu` and `usdms-ch.cosmic.ucar.edu` over the public internet. The

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UCAR COSMIC-PGD uses this same account and connection to provide INPE-COSMIC-PGD with schedules and TLE files.

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 UCAR COSMIC-PGD and INPE-COSMIC-PGD. Data is provided as free and open, based on international agreements. Information types based on NIST SP 800-60 are listed in the following table.

Security Categorizations

System	NIST SP 800-60 Vol II Information Type	Confidentiality	Integrity	Availability
UCAR 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 System Security Categorization of the UCAR COSMIC-PGD (Confidentiality = L, Integrity = M, Availability = L)

2.3.1.1 UCAR COSMIC-PGD receives VC products from the INPE-COSMIC-PGD system. This information has a security categorization of Confidentiality = Low, Integrity = Moderate, and Availability = Low as defined in the NIST SP800-60 Vol II Rev 1, D.8.1 Environmental Monitoring and Forecasting Information Type.

UCAR COSMIC-PGD provides INPE-COSMIC-PGD with Pass Schedules and TLE files. This information has a security categorization of Confidentiality = Low, Integrity = Moderate, and Availability = Low as defined in the NIST SP800-60 Vol II Rev 1, D.8.1 Environmental Monitoring and Forecasting Information Type.

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

- 2.3.2.1** INPE-COSMIC-PGD receives Pass Schedules and TLE files from the UCAR COSMIC-PGD system and delivers VC products to the UCAR COSMIC-PGD. This information has a security categorization of Confidentiality = Low, Integrity = Moderate, and Availability = Low as defined in the NIST SP800-60 Vol II 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 UCAR COSMIC-PGD and INPE-COSMIC-PGD.

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

All UCAR COSMIC-PGD and INPE-COSMIC-PGD personnel are required to take and pass Awareness Training. The UCAR COSMIC-PGD users are required to acknowledge the UCAR Rules of Behavior (RoB) prior to accessing the UCAR COSMIC-PGD system, and as a part of the annual UCAR Information Technology (IT) 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) 568 - 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 UCAR COSMIC-PGD and INPE-COSMIC-PGD. INPE uses a group account with a reusable passphrase, created by UCAR/COSMIC, which allows INPE to automate the file transfer process. The account is used for the purpose of delivering VC data products to the UCAR COSMIC-PGD, and delivering TLE and Pass Schedule files to the INPE-COSMIC-PGD. This account does not have the ability to elevate privilege. UCAR/COSMIC maintains the account on the UCAR COSMIC-PGD system and determines the appropriate passphrase strength and change policy. Both UCAR COSMIC-PGD and INPE-COSMIC-PGD are located within controlled access facilities, with alarms and 24x7

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monitoring. The INPE-COSMIC-PGD users access the system through their "login" and "password" used for accessing all INPE's internal systems. Differentiated authentication rules are not applied. COSMIC users access the COSMIC-PGD system with multifactor authentication utilizing a Yubico YubiKey. Individual INPE-COSMIC-PGD staff have no direct access to the UCAR COSMIC-PGD system.

2.6 Trusted Behavior Expectations

Systems administrators 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 should be coordinated sufficiently in advance to allow for the exercise of contingency plans as required. Unplanned outages should be reported to both system owners (SO) (and their representatives) as soon as possible.

The UCAR 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 shall maintain an Authorization to Operate (ATO) granted in accordance with the requirements of NIST Special Publication 800-37, Revision 1, *Guide for Applying the Risk Management Framework to Federal Information Systems: A Security Life Cycle Approach* (February 2010).

2.6.1 UCAR COSMIC-PGD ATO: granted 24 January 2018 and expires 23 January 2021.

2.6.2 INPE-COSMIC-PGD ATO: anticipated grant date: April 2019.

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. 4, *Security and Privacy Controls for Federal Information Systems and Organizations*, April 2013;

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- UCAR Corporate Policy 1-7, *Information Security*, December 2015;
- UCAR Corporate Policy 3-6, *Access to and Use of Computer and Information Systems*, September 2016;
- INPE/INPE-COSMIC-PGD InfoSec 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 UCAR COSMIC-PGD for incident reporting and handling, and identifies the associated policies and procedures for the UCAR Computer 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 UCAR COSMIC-PGD system to the COSMIC Incident Response Team (COSMIC IRT) by calling 303-497-8040 or by email using cosmic-sys@ucar.edu. The COSMIC IRT is available Monday through Friday from 8:00AM through 5:00PM Mountain Time (MT). To report incidents or violations outside the hours stated, please contact the UCAR Network Operations Center (NOC) at 307-996-4300 or 855-307-6972. The UCAR NOC 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.br.

System Points of Contact

Role	UCAR COSMIC-PGD	INPE-COSMIC-PGD
Incident Response Team	COSMIC IT and Operations Staff M-F, 8AM-5PM: 303-497-8040 cosmic-sys@ucar.edu cosmicops@ucar.edu	INPE COSMIC IT and operations staff M-F, 8AM-5PM: +55 12 3186 9552

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Role	UCAR COSMIC-PGD	INPE-COSMIC-PGD
		ivan.barbosa@inpe.br security@inpe.br
System 24-Hour Contact Information	307-996-4300 or 855-307-6972	Not Available
System Owner	William S. Schreiner schrein@ucar.edu 303-497-2603	Joaquim E. Rezende Costa joaquim.costa@inpe.br +55 12 3208 7191
System Owner Representative	Jan Weiss weissj@ucar.edu 303-497-2605	Marcelo Banik de Pádua marcelo.banik@inpe.br +55 12 3208 7890
Network Manager	Michael Rousseau rousseau@ucar.edu 303-497-2667	STI Gestão gestao.scsti@inpe.br +55 12 3208 6760
Information System Security Officer	Jose Castilleja castille@ucar.edu 303-497-2669	STI Gestão gestao.scsti@inpe.br +55 12 3208 6760

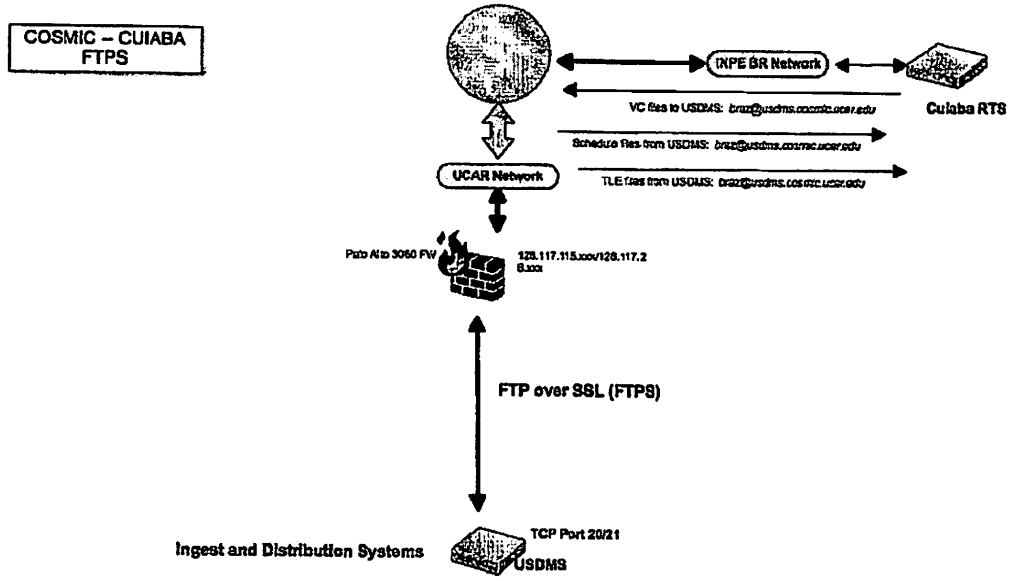
2.9 Audit Trail Responsibilities

The UCAR COSMIC-PGD staff review logs pertaining to INPE-COSMIC-PGD on a weekly basis. Our 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 Information System Security Officer (ISSO) for review. Audit logs are retained for a minimum of three (3) months.

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

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3 TOPOLOGICAL DRAWING



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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 either signature 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.

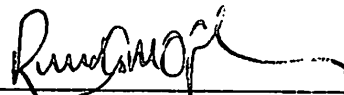
We further understand that noncompliance on the part of either UCAR/COSMIC or INPE/INPE-COSMIC-PGD or its users or contractors with regards to Department of Commerce (DOC), NOAA, NESDIS information security policies, standards, and procedures explained herein may result in the immediate termination of this agreement.

**COSMIC-PGD (NOAA5049)
Co-Authorizing Official (co-AO) and
Deputy Director, Office of Projects,
Planning, and Analysis**


**INPE
Authorizing Official (AO)
Director**

Richard Ullman
ULLMAN.RICHARD.E
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Digitally signed by
ULLMAN.RICHARD.EMANUEL.136
9051071
Date: 2019.04.10 13:10:17 -04'00'

Signature _____ Date _____

Ricardo M. O. Galvão

Signature _____ Date _____

**COSMIC-PGD (NOAA5049)
Co-Authorizing Official (co-AO) and
NOAA Assistant Chief Information
Officer for Satellites**

Irene Parker

Signature _____ Date 4/11/19

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**COSMIC-PGD (NOAA5049)
System Owner and Director of the
Constellation Observing System for
Meteorology, Ionosphere, and Climate
Program**

William S. Schreiner

Bill Schreiner

Digitally signed by Bill Schreiner
Date: 2019.02.06 10:06:06 -07'00'

Signature

Date