

# SURYA SATELLITE – 1 (SS-1)

## IMPACT AND LESSONS LEARNED FROM INDONESIA'S NANO-SATELLITE PIONEER

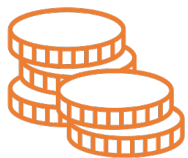
Milan, October 2024 – UN/IAF Workshop



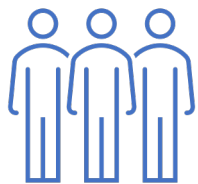
# SS-1 Journey

System Specifications	
Mission	Automatic Packet Reporting System (APRS)
Bus	1U
Mass	1.12 kg
Dimension	100 x 100 x 113.5 (mm)
Communication	UHF & VHF, 8kHz bandwidth
Solar Panel	GaAs Triple-junction (3 Wp)
Battery	Li-Ion 10 Ah
Power (Tx)	1 W

## Project Challenges



Very limited resources  
→ Build from scratch



Manpower with  
mixed priority



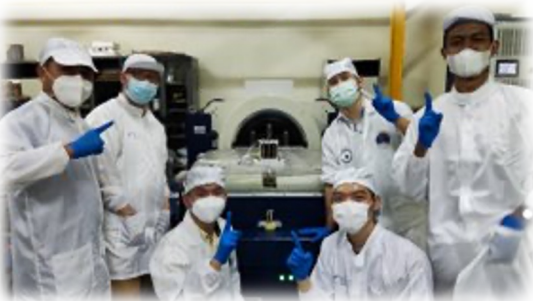
Pandemic  
Situation

## SS-1 Milestones



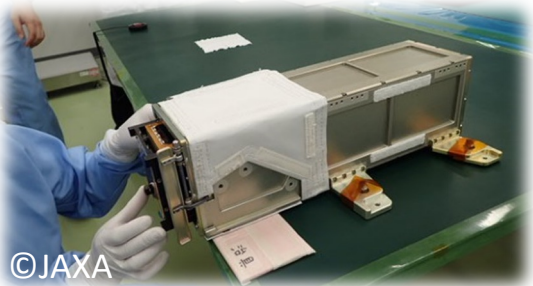
Awarded 3<sup>rd</sup> KiboCube

2018



Satellite AIT

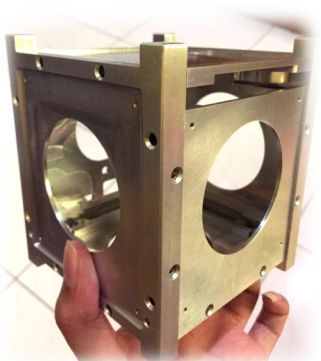
2021



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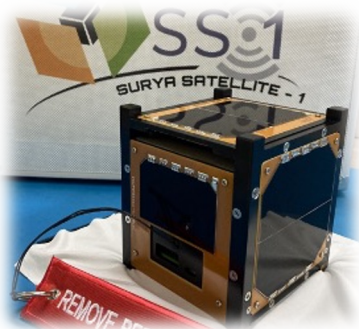
Handover to JAXA

2022



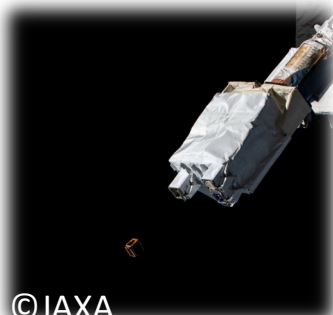
Satellite Manufactured

2020



Ready to Ship

2022



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Deployed from ISS

2023

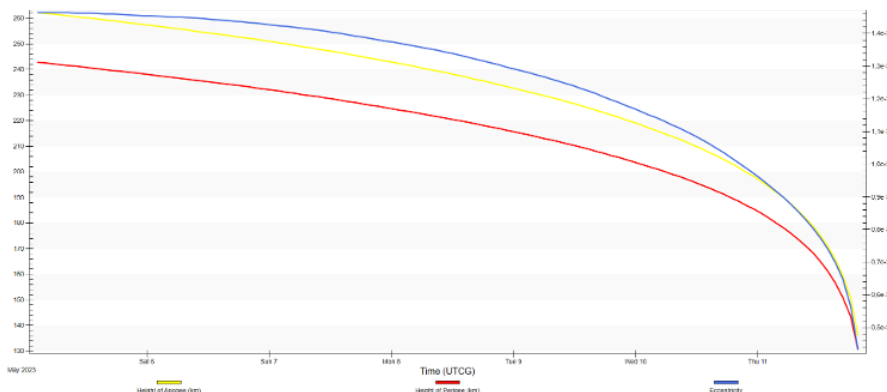


# SS-1 Lessons Learned

Stations in which SS-1 signals are received



SS-1 Apogee, Perigee, and Eccentricity Prior to Re-Entry



## Results

- **First signal acquisition**  
received at 6 Jan 2023 @ 15:32:52 Jakarta Time  
→ exactly 30 minutes after deployment, which is the ideal case
- **Operational Status**  
SS-1 signal received globally  
Beacon, telemetry, and APRS can be decoded
- **End of Life:**  
The last orbital two-line-elements (TLE) was on 9 May 2023 (UTC).  
SS-1 reached Karman Line on 11 May 2023 — four months in orbit,  
which has fulfilled the space sustainability.

## Significant Achievements

- **First Indonesia** Nano-satellite reached orbit
- 3<sup>rd</sup> Round **KiboCUBE** Awardee
- ~90% subsystems are **developed in-house**
- **5 Scientific Publications** Released
- > **1M views** on launch and deployment events from mainstream media



# SS-1 Impacts in Indonesia

## SS-1 Stakeholders: enabling Indonesia collaboration in Space

### Academic: Team Members



### Private Industry: Manufacturing & Operations



### Government: Development, Testing, Regulatory



### Organizations: Spectrum License, Users



## SS-1 Team Members: New Young Space Professionals

### Afiq H Sulistya

Satellite Technology Specialist, PSN - Indonesia  
LPDP Scholarship Awardee

### Setra Yoman P

MSE, TU Berlin - Germany  
LPDP Scholarship Awardee

### Hery Steven

ME, Kyushu Institute of Technology - Japan  
PNST Scholarship Awardee

### Suhandinata

MSAE, Georgia Institute of Technology - USA  
Fulbright Scholarship Awardee

### Roberto Gunawan

Smartcard Technology Specialist, IDEMIA - Indonesia

### Muhammad Zulfa D

Satellite Application Engineer, PSN - Indonesia

## Nano-Satellite Projects after SS-1:

### Academics:

- Indonesia Defense University (UNHAN)
- Telkom University
- Universitas Gadjah Mada (UGM)

### Private Enterprise:

- PT Pasifik Satelit Nusantara (PSN)
- PT Netra Teknologi Nusantara



# AFIQ HERDIKA SULISTYA



**PT PASIFIK SATELIT NUSANTARA (PSN)**

Open for small satellite and  
launch collaboration

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**LPDP SCHOLARSHIP AWARDEE**

Looking for a Master's Degree  
Program in Aerospace  
Engineering

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