

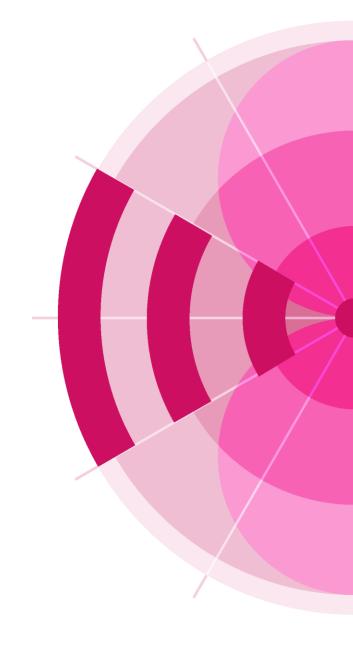
30TH WORLD RADIOCOMMUNICATION SEMINAR

24 – 28 October 2022 Geneva, Switzerland

A MILESTONE APPROACH FOR NGSO SYSTEMS RESOLUTION 35 (WRC-19)

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Space Services Department, BR, ITU

www.itu.int/go/wrs-22 #ITUWRS



Content

- 1. Resolution 35 procedure
- 2. Submission
- 3. Publication
- 4. Website





RES 35

INTRODUCTION

BIU of NGSO in FSS, MSS, BSS = one satellite in one orbital plan

Filing of satellite systems composed of thousands of non-GSO satellites



Milestone-based approach

balance between spectrum warehousing, coordination mechanisms and operational requirements





SATELLITE SYSTEMS SUBJECT TO RES 35

Frequency bands and services for application of the milestone-based approach Space radiocommunication services Bands (GHz) FIXED-SATELLITE FIXED SATELLITE (space-to-Earth) FIVED-SATELLITE (Earth-to-space) 11.70-12.50 FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (space-to-Earth) BROADCASTING-SATELLITE FIXED-SATELLITE FIXED-SATELLITE BROADCASTING FIXED-SATELLITE FIXED-SATELLITE 12.75-13.25 FIXED-SATELLITE (Earth-to-space) 13.75-14.50 FIXED-SATELLITE (Earth-to-space) FIXED-SATELLITE TXED-SATELLITE (unace-to-Earth) (Earth-to-space) 17.70-17.80 FIXED-SATELLITE FIXED-SATELLITE (space-to-Earth) (space-to-Earth) FIXED-SATELLITE FIXED-SATELLITE FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space) 18.10-19.30 FIXED-SATELLITE (space-to-Earth) 19.30-19.60 FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space) 19.60-19.70 FIXED-SATELLITE (space-to-Earth) (Earth-to-space) FIXED-SATELLITE FIXED-SATELLITE (space-to-Earth) (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) FIXED-SATELLITE (space-to-Earth) 20 10-20 20 MOBILE-SATELLITE (space-to-Earth) 27.00-27.50 27.50-29.50 FIXED-SATELLITE (Earth-to-space) 29.50-29.90 FIXED-SATELLITE (Earth- FIXED-SATELLITE FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE 29.90-30.00 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) 37.50-38.00 FIXED-SATELLITE (space-to-Earth)

426

Bands (GHz)	Space radiocommunication services							
Danas (Griz)	Region 1	Region 2	Region 3					
9.50-40.50	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)							
0.50-42.50	FIXED-SATELLITE (space-to BROADCASTING-SATELLI							
47.20-50.20	FIXED-SATELLITE (Earth-to-space)							
50.40-51.40	FIXED-SATELLITE (Earth-to	-space)						

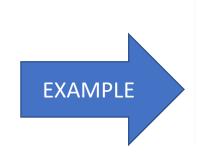


38.00-39.50 FIXED-SATELLITE (space-to-Earth)

APPLIES TO:

All Non-GSO satellite systems in the following bands and services and brought into use (No.11.44 and No.11.44C)

FSS, MSS, BSS



Frequency	Space radiocommunication services						
bands (GHz)	Region 1	Region 3					
10.70-11.70	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (space-to	-Earth)				
11.70-12.50	FIXED-SATELLITE (space-to	-Earth)					
12.50-12.70	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE	FIXED-SATELLITE (space-to-Earth)	BROADCASTING- SATELLITE FIXED-SATELLITE				

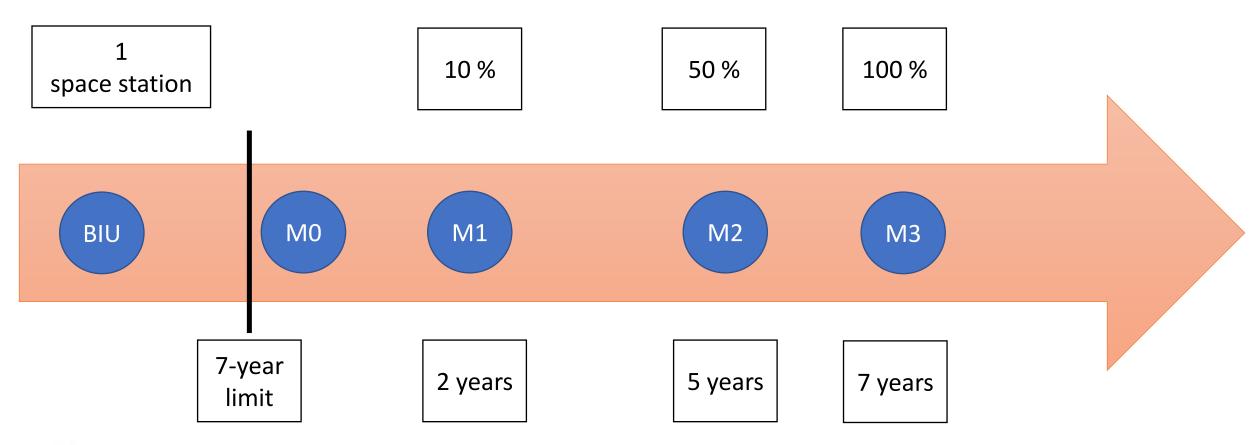
10.7 - 13.25, 13.75 - 14.5, ..., 47.2 - 50.2, 50.4 - **51.4 GHz**

39.50-40.50	FIXED-SATELLITE (space-to-Earth)
	MOBILE-SATELLITE (space-to-Earth)
40.50-42.50	FIXED-SATELLITE (space-to-Earth)
	BROADCASTING-SATELLITE
47.20-50.20	FIXED-SATELLITE (Earth-to-space)
50.40-51.40	FIXED-SATELLITE (Earth-to-space)



TIMEFRAME

Space stations deployed





Time



PROCEDURE

Case 1: 7-year limit before 1 January 2021

Case 2: 7-year limit after 1 January 2021

Initial deployment information (M0)

- Case 1: 01.01.2021 + 30 days = 01.02.2021
- Case 2: 7-year-limit + 30 days or DBIU + 120 days (latest)

3 Milestones

Case 1 / Case 2

- M1: 10% 01.01.2023 + 30 days / (7 year-limit + 2 years) + 30 days
- M2: 50% 01.01.2026 + 30 days / (7 year-limit + 5 years) + 30 days
- M3: 100% 01.01.2028 + 30 days / (7 year-limit + 7 years) + 30 days



Failure to meet a Milestone:

Reduction of the number of satellite in the system (exception: Resolve 12)



DEPLOYMENT INFORMATION

Satellite system information

- Name of the satellite system
- Notifying administration
- Milestone

Launch information

- Launch date
- Launch country
- Facility Name
- Launch provider
- Launch Vehicle



Space station characteristics

- Orbital plane ID
- Station name
- Apogee
- Perigee
- Inclination
- Argument of Perigee



Frequency bands

- Frequency minimum
- Frequency maximum

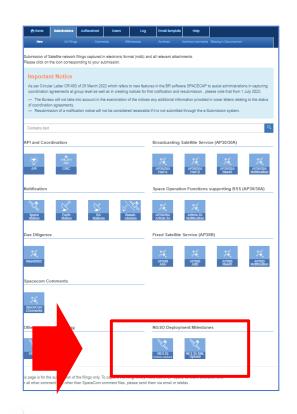




E-SUBMISSION TOOLS

E-submission

- Online capture
- Upload XML file





NGSO Deployment Milestones









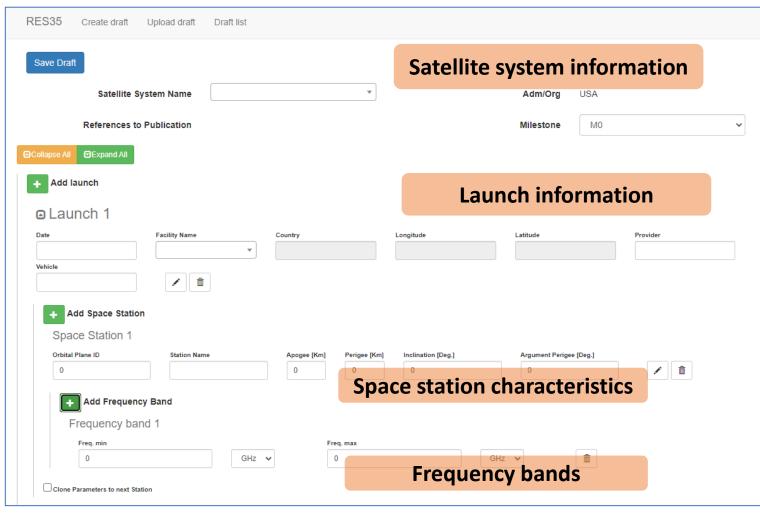
ONLINE CAPTURE

RES 35 - SUBMISSION

E-submission

- Online capture
- Upload XML file









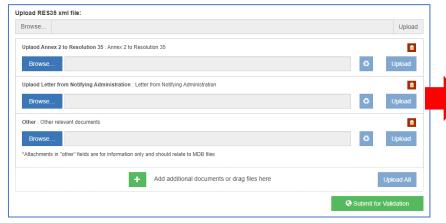
XML FILE UPLOAD

RES 35 - SUBMISSION

E-submission

- Online capture
- Upload XML file







RES 35 SPECIAL SECTION

Information is published on:

BRIFIC DVD-ROM

Space services website

Database srs_res35.mdb

https://www.itu.int/net/ITU-R/space/snl/bresult/radvance.asp?sel_type=RES35

WIC/IFIC

date

15.06.2021

15.06.2021

15.06.2021

15.06.2021

15.06.2021

15.06.2021

ID number (SNS)	adm	ORG or Geo.area	Satellite name	Earth station	long_nom	Date of receipt	ssn_ref	ssn_no	ssn	rev/ Sup	ssn rev no	removal	Part/ Art.	WIC/IFIC (ific.md
up down	up down	up down	up down	<u>up</u> down	up down	<u>up</u> <u>down</u>	up down	<u>up down</u>						up down
121535003	USA		<u>USCSID-P</u>		N-GSO	22.01.2021	RES35	1						<u>2948</u>
121535008	F		MCSAT LEO		N-GSO	20.01.2021	RES35	2						<u>2948</u>
121535001	G		<u>03B-A</u>		N-GSO	29.01.2021	RES35	3						<u>2948</u>
121535002	G		<u>O3B-B</u>		N-GSO	29.01.2021	RES35	4						<u>2948</u>
121535010	J		QZSS-1		N-GSO	12.03.2021	RES35	5						<u>2948</u>
121535009	USA		HIBLEO-2FL		N-GSO	03.03.2021	RES35	6						<u>2948</u>
121535015	LIE		3ECOM-1		N-GSO	18.06.2021	RES35	7						
121535006	G		<u>L5</u>		N-GSO	27.01.2021	RES35	8						
121535011	F		MCSAT-2 HEO		N-GSO	18.03.2021	RES35	9	П					
121535004	CAN		COMMSTELLATION		N-GSO	17.12.2020	RES35	10			UNION INTERNATI	ONALE DES T	ti tooreninos	TIONS INTERNATIONA
121535007	USA		HIBLEO-2FL2		N-GSO	26.01.2021	RES35	11	П				MUNICATIONS	TIONS INTERNATIONA RADIOC



INTERNATIONAL TELECOMMUNICATION UNION

UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

DUREAU DES P	VIDIOCOMMUNICATIONS	IVA	DIOCOMMUNICATIONE	UNEAU	OFICINA DE RADIOCOMUNICACIONES	P 1.1.0.
RÉSEAU À SATELLITE SATELLITE NETWORK RED DE SATÉLITE	CC	OMMSTELLATIO	N	SECTION SPÉCIALE Nº SPECIAL SECTION No. SECCIÓN ESPECIAL N.º	RE\$35/10	
ADM. RESPONSABLE RESPONSIBLE ADM. ADM. RESPONSABLE	CAN	LONGITUDE NOMINALE NOMINAL LONGITUDE LONGITUD NOMINAL	NGSO	BR IFIC / DATE BR IFIC / DATE BR IFIC / FECHA	2957 / 19.10.2021	
RES35 MILESTONE ÉTAPE EN VERTU DE LA PERIODO INTERMEDIO D		M0		NUMÉRO D'IDENTIFICATION IDENTIFICATION NUMBER NÚMERO DE IDENTIFICACIÓN	121535004	
RENSEIGNEMENTS REC	US PAR LE BUREAU LE /	INFORMATION RECEIVED B	Y THE BUREAU ON / IN	FORMACIÓN RECIBIDA POR LA	OFICINA EL 17.12.2020	



Ces renseignements ont été reçus conformément aux points 2, 3, 7 ou 8 du décide de la Résolution 35 (CMR-19). Le Bureau des radiocommunications les publie conformément aux points 5 et 10

indication de l'étape en vertu de la RE\$35 :

M0: renseignements initiaux relatifs au dépiolement

conformément aux points 2 et 3 du décide M1: 1ère étape, conformément aux points 7a et 8a du décide M2: 2ême étape, conformément aux points 7b et 8b du décide

M0: Initial deployment information, pursuant to resolves 2 and 3

M1: 1st Milestone, pursuant to resolves 7a and 8a M2: 2st Milestone, pursuant to resolves 7b and 8b M3: 3rd Milestone, pursuant to resolves 7c and 8c

This information has been received pursuant to resolves 2, 3, 7 | Esta información se ha recibido de conformidad con los or of Resolution 35 (WRC-15), it is published by the Radiocommunication Bursau in accordance with resolves 5 and Officina de Radiocommunicaciones is publica de

M1: 1* plazo, con arregio a los resuelve 7a y 8a. M2: 2* plazo, con arregio a los resuelve 7b y 8b. M3: 3er plazo con arregio a los resuelve 7c y 8c.





Table I: List of groups in the notification subject to this Resolution 35 submission

BR6a/BR6b Id no.	B1a Beam designation	B2 Emi_Rcp	B7a Group id.	BR47 Frequency band (MHz)	A2a Date of bringing into use	BR105 Current Milestone	BR110 Expiry of the milestone period	BR106 Milestone criteria met	BR107 Expiry of the next milestone period
118500298	KAU1	R	118745633	27500 - 28300	16.04.2018	M0	01.01.2021	Υ	01.01.2023
118500298	KAU1	R	118745634	29500 - 30000	16.04.2018	MO	01.01.2021	Y	01.01.2023
118500298	KAU1	R	118745635	28300 - 29100	16.04.2018	M0	01.01.2021	Y	01.01.2023
118500298	KAU1	R	118745636	29500 - 30000	16.04.2018	M0	01.01.2021	Y	01.01.2023
118500298	KAU1	R	118745637	29500 - 29900	16.04.2018	M0	01.01.2021	Y	01.01.2023
118500298	KAU1	R	118745638	29600 - 30000	16.04.2018	M0	01.01.2021	Y	01.01.2023
118500298	KAU1	R	118745651	29250 - 29500	16.04.2018	M0	01.01.2021	Y	01.01.2023
118500298	KAU2	R	118745602	27500 - 28300	16.04.2018	M0	01.01.2021	Y	01.01.2023
118500298	KAU2	R	118745603	29500 - 30000	16.04.2018	M0	01.01.2021	Y	01.01.2023
118500298	KAU2	R	118745604	28300 - 29100	16.04.2018	M0	01.01.2021	Y	01.01.2023
119500209	KVIIO	D	1197/5605	20200 30000	16.04.2018	MO	01.01.2021	V	01 01 2023

Display only the groups of the SNS Notification modified by the current RES 35 submission.





Table II: List of the orbital planes in the notification and corresponding deployed space stations

	ORBITAL PARAMETERS IN THE NOTIFICATION								
BR6a/BR6b Id no.	BR93 Orbital plane id no.	A4b4a Inclination angle	A4b4d Apogee	A4b4e Perigee	A4b4i Arg. of perigee	A4b4b No. of space stations in this plane	BR111 Number of space stations deployed in this plane		
118500298	1	99.5	1000	1000	0	12	0		
118500298	2	99.5	1000	1000	0	12	0		
118500298	3	99.5	1000	1000	0	12	0		
118500298	4	99.5	1000	1000	0	12	0		
118500298	5	99.5	1000	1000	0	12	0		
118500298	6	99.5	1000	1000	0	12	0		
118500298	7	37.4	1248	1248	0	9	0		
118500298	8	37.4	1248	1248	0	9	0		
118500298	9	37.4	1248	1248	0	9	0		
118500298	10	37.4	1248	1248	0	9	0		
118500298	11	37.4	1248	1248	0	9	0		
118500298	12	99.5	1003.8	996.4	344.6	1	1		
BR112 Total	number of space stati	ons notified / BR113	Total number	of space stati	ons deployed	118	1		



Display all orbital planes of the SNS Notification and total number of deployed space stations.



Table III: Satellite system deployment by frequency band

BR114	Frequency ba	ınd	BR118	BR119	BR120	BR121	
BR117 ID of the frequency band	BR115 Freq min (MHz)	BR116 Freq max (MHz)	Number of space stations notified by frequency band	Number of space stations deployed by frequency band	Percentage of space stations deployed vs notified	Milestone met (YES/NO)	
1	17300	17800	73	1	1.37%	Υ	
2	17800	18600	118	1	0.85%	Υ	
3	18800	19300	118	1	0.85%	Υ	
4	19700	20200	118	1	0.85%	Υ	
5	27500	29100	118	1	0.85%	Υ	
6	29250	29500	73	1	1.37%	Υ	
7	29500	30000	118	1	0.85%	Υ	

Display the deployment in all the frequency bands.

The column BR121 indicates if the Milestone has been reached.





Table IV: Launch information for the deployed space stations

BR122 ID of the launch	BR34 Name of the launch vehicle provider	BR35 Name of the launch vehicle	BR38 Name of the launch facility	BR39 Country/location	BR Geographica		BR91 Launch date
1	ISRO	PSLV	SRIHARIKOTA	IND	080E17 60	013N48 00	12.01.2018

Display the launch information for the deployed stations





Table V: Characteristics of the deployed space stations

RES 35 - PUBLICATION

Tableau V / Table V / Cuadro V / 表五 / Таблица V / V الجدول

Characteristics of the deployed space stations
Caractéristiques des stations spatiales déployées
Características de las estaciones espaciales desplegadas
已部署空间电台的特性

характеристики развернутых космических станций

خصائص المحطات الفضائية التي نُشرت

BR123	BR122	BR124	BR93		BR129	Orbital characterist	ics	BR117
ID of the space station	ID of the launch	space station	nace station number		BR126 Perigee	BR127 Inclination angle	BR128 Arg. of perigee	ID of the frequency band (see Table III)
1	1	LEO-1	12	1003.8	996.4	99.50	344.6	1,2,3,4,5,6,7

BR117: indicates the frequency bands on-board the space stations with reference to the deployed frequency bands in table III

BR114 Frequency band							
BR117 ID of the frequency band	BR115 Freq min (MHz)	BR116 Freq max (MHz)	r				
1	17300	17800					
2	17800	18600					
3	18800	19300					
4	19700	20200					
5	27500	29100					
6	29250	29500					
7	29500	30000					





WEBPAGE

RES 35 - WEB

Submission through E-submission

Publications

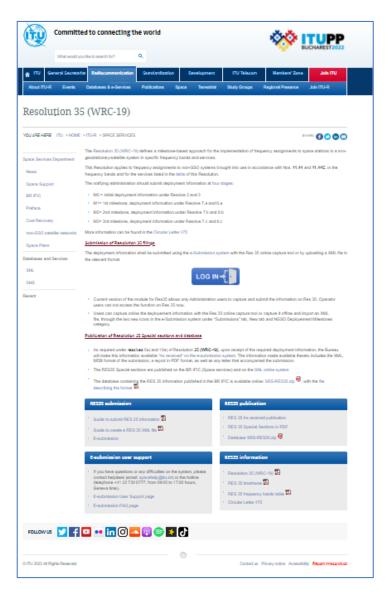
- As received
- RES35 Special sections in PDF
- RES 35 database

Information on

- How to submit (XML file format)
- Resolution 35 procedure

https://www.itu.int/en/ITU-R/space/Pages/res35main.aspx





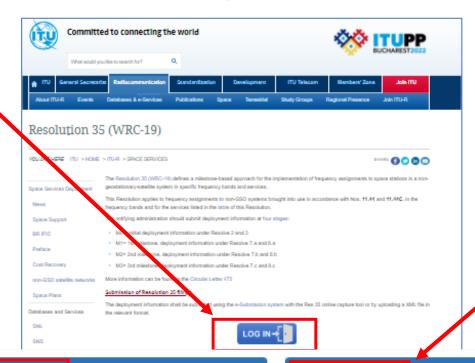


LINKS

RES 35 - WEB

To submit (E-submission)

Help on submission



Publication

Help on RES 35

RES35 submission

- Guide to submit RES 35 information
- Guide to create a RES 35 XML file
- E-submission

RES35 publication

- RES 35 As received publication
- RES 35 Special Sections in PDF
- Database SRS-RES35.zip

E-submission user support

- If you have questions or any difficulties on the system, please contact helpdesk (email: spacehelp@itu.int) or the hotline (telephone +41 22 730 6777, from 09:00 to 17:00 hours, Geneva time).
- E-submission User Support page

RES35 information

- Resolution 35 (WRC-19)
- RES 35 timeframe 🛂
- RES 35 frequency bands table 🛂





https://www.itu.int/en/ITU-R/space/Pages/res35main.aspx

Summary

1. Resolution 35 → milestone-based approach



- 2. Submission → 2 tools: online capture + XML upload
- 3. Publication \rightarrow 5 tables
- 4. Website → Information (Res35, submission, publication)





Thank you!

ITU – Radiocommunication Bureau

Questions to brmail@itu.int or xueling.zhang@itu.int



