

Republic of Malawi  
Ministry of Transport and Public Works

The Project  
for  
Capacity Development  
for  
Radar Air Navigation Services  
at  
Kamuzu International Airport  
Project Completion Report

January 2022

JAPAN INTERNATIONAL COOPERATION AGENCY

GYROS CORPORATION

IM
JR
22-011



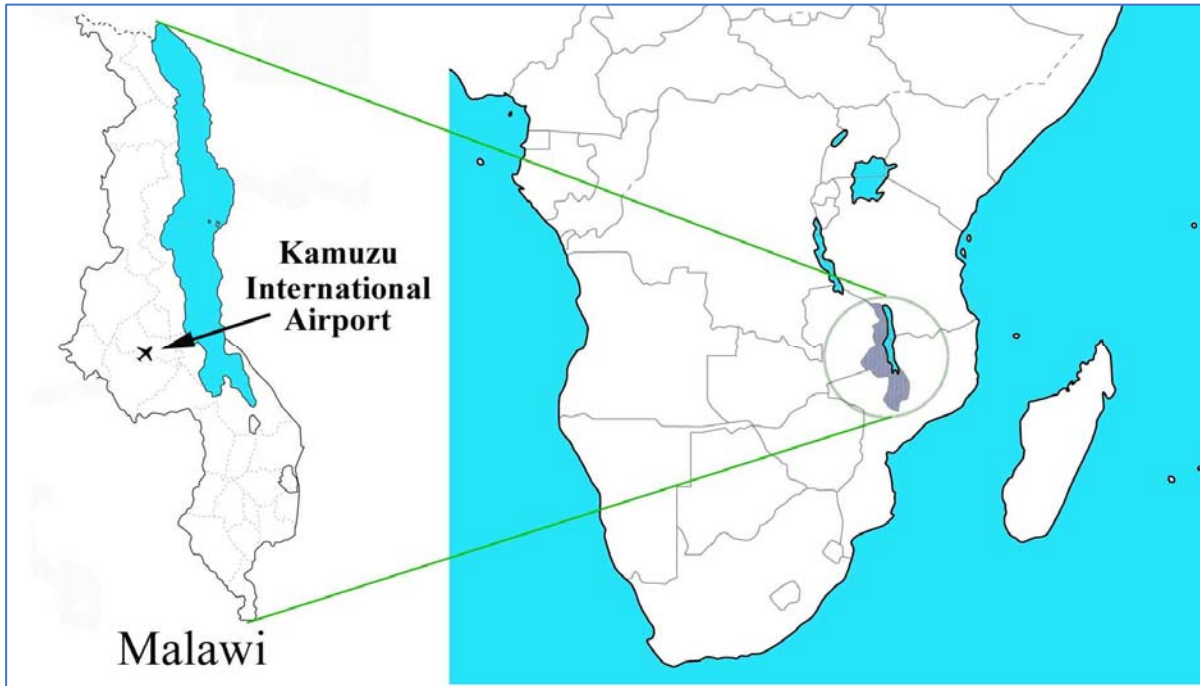
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## Attachment

<b>ANNEX-1</b>	<b>Result of the Project</b>
<b>ANNEX-2</b>	<b>List of Products. Produced by the Project</b>
<b>ANNEX-3</b>	<b>PDM (Project Design Matrix) all versions</b>

## Project Location



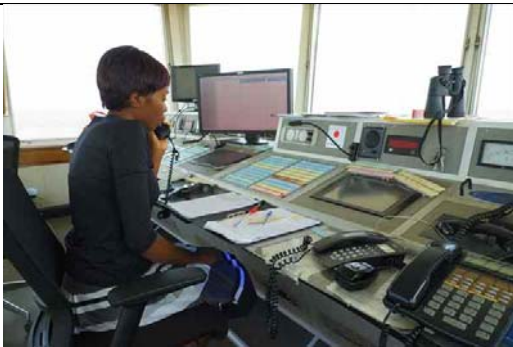
**Kamuzu International Airport**



Radar Site



New Radar Antenna



Tower Control OJT



Radar Control Simulator Training



Radar Control Simulator Training



Radar Control Simulator Training



Radar Control Simulator Training



Radar Control Simulator Training



Radar Maintenance Training



Radar Maintenance OJT



AIS AIRAC Training for Radar



AIS AIRAC Training for Radar



Departure for Training at EASA (Kenya)



Girls Student Site Tour



Radar Flight Inspection Team



Japanese Ambassador Site Tour

## Abbreviations

ADS-B	Automatic Dependent Surveillance - Broadcasting
ATC	Air Traffic Control
ATS	Air Traffic Service
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
AIS	Aeronautical Information Service
ATM	Air Traffic Management
ATNS	Air Traffic and Navigation Service (South Africa)
BLZ	Blantyre Airport (Chileka Airport)
CIA	Chileka International Airport
CNS	Communication, Navigation and Surveillance
C/P	Counterpart
DAC	Development Assistance Committee
DCA	Department of Civil Aviation
EASA	East African School of Aviation
EIB	European Investment Bank
EU	European Union
FIC	Flight Information Center
FIS	Flight Information Service
ICAO	International Civil Aviation Organization
JCC	Joint Coordinating Committee.
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
JPY	Japanese Yen
KIA	Kamuzu International Airport
LLW	Lilongwe Airport (Kamuzu International Airport)
MATS	Malawi Air Traffic Standard
M/M	Minutes of Meeting
MOTPW	Ministry of Transport and Public Works
MSDPS	Multi Sensor Data Processing System
OJT	On the Job Training
PD	Project Director
PDM	Project Design Matrix
PM	Project Manager
PO	Plan of Operation
R/D	Record of Discussion
STEM	Science Technology Engineering and Mathematics
SMP	Standard Maintenance Procedures
SOA	School of Aviation

SOP	Standard Operation Procedures
SSR	Secondary Surveillance Radar
TOT	Training of Trainers
USD	US Dollar



## **I. Basic Information of the Project**

### **1. Country**

Republic of Malawi

### **2. Title of the Project**

The Project for Capacity Development for Radar Air Navigation Services at Kamuzu International Airport

### **3. Duration of the Project (Planned and Actual)**

Planned: 30 months

Actual: 56 months (Extended due to a delay of official commissioning check of the radar and pandemic of the Covid-19.

### **4. Background (from Record of Discussions(R/D))**

Air Transportation plays an important role for Malawi in trade and external relations with foreign countries due to its nature as a land-locked country. However, airports and air navigation facilities in Malawi are not sufficient for the safety requirements of the International Civil Aviation Organization (ICAO), and in need of rehabilitation and upgrading to improve air safety, to enhance passenger and cargo movements, to promote tourism industries and to increase exports of agricultural products.

The aircraft surveillance system at Kamuzu International Airport was initially installed in 1982 under the Yen-loan New Lilongwe International Airport Construction project, but has already been obsolescent and currently not working, which constitutes a risk for air navigation services in Malawi. To cope with this situation, the Government of Malawi is implementing “the Project for Expansion of the Terminal Building at Kamuzu International Airport” with grant assistance from the Government of Japan, in which new aircraft surveillance system is included in the scope of the project. However, officers and engineers of the Department of Civil Aviation (DCA), who had experience of operation and maintenance of the old aircraft surveillance system, have already been retired.

The Government of Malawi, along with modernization of aircraft surveillance system under the grant aid project, recognized the need to develop its capacity for operation and maintenance of the aircraft surveillance system, and requested the Government of Japan for the implementation of the Capacity Development Project for Radar Air Navigation Services at Kamuzu International Airport.

### **5. Overall Goal and Project Purpose (from Record of Discussions(R/D))**

#### Overall Goal:

DCA sustainably provides radar control service as published in Aeronautical Information Publication and improves safety and reliability of air transportation service in Malawi.

#### Project Purpose:

DCA operates and maintains an aircraft surveillance system.

### **6. Implementing Agency**

Department of Civil Aviation (DCA), Ministry of Transport and Public Works (MOTPW)

## II. Results of the Project

### 1. Results of the Project

Project's input was provided, and activities were implemented based on PO. PO was modified in accordance with the extension of the Project period. Please refer to ANNEX1 –1 for PO with the initial plan, modified and actual.

#### 1-1 Input by the Japanese side

Input from Japanese side is JICA expert, Equipment, and Project's cost. They were implemented as planned according to PO. Please refer to ANNEX 1-2 for Input from Japanese side for detail.

#### (1) Total Cost

Planned: 242 million Yen

Actual: 264 million Yen

#### (2) Assignment of JICA expert

By the end of November 2021, seven (7) JICA experts are assigned in the field of Chief Advisor, Radar Control Service, Simulator Training, Radar Maintenance Service, AIRAC, Project Evaluation, and Project Coordination.

Position/Technical Field	Planned (Months)	Actual (Months)
- Chief Advisor / ATC Training Manager	16.10	24.70
- Radar Control Services Expert	10.32	9.24
- Simulator Training Expert	2.83	6.22
- Radar Maintenance Service Expert	8.73	8.27
- AIRAC Expert	0.00	1.00
- Project Evaluator	1.00	0.82
- Project Coordinator	1.50	1.50
Total	38.98	51.75

#### (3) Provision of equipment

The project provided equipment related to executing the training.

Cost: 4.2 million Yen

##### <Training equipment>

Laptop PC & Projector, the trainees need to refer the international regulations and technical information in the training.

##### <Office equipment>

Copy machine, printer and UPS (Uninterrupted Power System), these kinds of equipment is necessary for office works and especially the UPS is necessary under the situation of Malawi because of Malawi has black-out often.

#### (4) C/P training in the third country

Twelve (12) Air Traffic Controllers were trained on the curriculums of the Radar Control Service at EASA Kenya. Four (4) CNS Engineers were trained on the curriculums of the Radar Maintenance Service at EASA. Three (3) Air Traffic Controllers and two (2) CNS Engineers were trained on OJT Instructor Training at EASA Kenya.

Cost: 35 million yen (Tuition, Transportation, Allowance, Accommodation and Insurance)

Training	Planned	Actual
Training in EASA (East African School of Aviation)	1,957 person days	1,957 person days
- Basic Radar Air Traffic Control	6 persons, 133 days (2 times)	6 persons, 133 days (2 times)
- SSR and ADS-B Maintenance Course	4 persons, 56 days (1 time)	4 persons, 56 days (1 time)
- OJT Instructor Course	5 persons, 5 days (1 time)	5 persons, 5 days (1 time)
Total	1,957 person days	1,957 person days

### 1-2 Input by the Malawi side

(1) Assignment of counterpart personnel

Five (5) counterparts, five (5) ATC Radar Control Task Force members and three (3) Radar Maintenance Task Force members, in total, were assigned to the project.

(2) Budget for the training allowance and local cost for the project.

The Malawi government, DCA provided office space in the School of Aviation. It includes the cost of the expense for water, electricity, fuel for mini-bus, trainee's transportation, and allowance.

Cost: 45 million kwacha

(3) Training in the third country

Eleven (11) ATC officers participated in on the curriculums of ATC Basic ATNS South-Africa for 8 weeks under the cost from Malawi side.

### 1-2 Activities

Following activities were/are to be implemented based on PO, including thirty (30) training courses. Please refer to ANNEX 1-4 for detail.

(1) Activities related to Output 1: Capacity Development in Radar Control Services at KIA

Activities	Planned	Results (November 2021) PCR
1-1 To attend training on Radar Control Services at EASA	At least 10 ATC officers have completed.	12 ATC officers have completed by May 2018
1-2 To develop an air-space plan with Radar Control Services	AIRAC on Radar have been issued	AIRAC have been issued on September 2019
1-3 To develop Standard Operation Procedures (SOP) for Radar Control Services	SOP has been developed	SOP has been developed as Ver.1 December 2017
1-4 To conduct simulator training on Radar Control Services under the guidance of JICA Expert	At least 10 ATC officers have	12 ATC officers have completed simulator

		completed	training by end August 2018
1-5	To attend OJT Instructor Training at EASA	3 ATC officers have completed training	3 ATC officers completed in June 2018
1-6	To provide Radar Control rating	15 ATC officers have been acquired radar rating	16 ATC officers have been rated but 4 officers have been retired (21 officers expected to be rated by early 2022)
1-7	To conduct aircraft surveillance system test operation for hands-on training of ATC officers under the guidance of JICA Expert	10 ATC officers have been completed hands-on training	10 ATC officers have completed hands-on training under JICA expert
1-8	To monitor Radar Control Services and amend SOP as necessary	SOP has been developed	SOP has been updated on Dec.2019 and Mar. 2021

According to the hearing from Malawi counterparts, ...

(2) Activities related to Output 2: Capacity Development in Radar Controller Training at SOA

Activities		Planned	Results (November 2021) PCR
2-1	To develop syllabus and training materials for basic training on Radar Control Services	Developed	Completed by June 2019
2-2	To conduct basic training on Radar Control Services by SOA Instructor	At least 5 new ATC officers completed Basic training	11 new ATC officers have completed in 2020
2-3	To conduct simulator training on Radar Control Services by SOA Instructor	At least 5 new ATC officers completed Simulator training	11 new ATC officers completed simulator training
2-4	To conduct on-the-job training of Radar Control Services by KIA OJT Instructor	At least 5 new ATC officers completed hands-on training	3 new ATC have completed and 8 are under hands-on training

(3) Activities related to Output 3: Capacity Development in Aircraft Surveillance System Maintenance at KIA

Activities		Planned	Results (November 2021) PCR
3-1	To attend training on radar maintenance services at EASA	At least 3 CNS engineers have completed	4 CNS engineers have completed by March 2018
3-2	To develop Standard Maintenance Procedures (SMP) for Aircraft Surveillance System at KIA	SMP has been developed	SMP has been developed in 2018
3-3	To attend on-the-job training of Aircraft Surveillance System Maintenance Services at KIA by the manufacturer	At least 3 CNS engineers have completed OJT by manufacturer	8 CNS engineers have completed maintenance OJT by NEC
3-4	To monitor Aircraft Surveillance System Maintenance Services at KIA and amend	SMP has been amended as	SMP has been updated in

SMP as necessary	necessary	November 2021
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(4) Activities related to Output 4: Capacity Development in Aircraft Surveillance System Maintenance Engineer Training at SOA

Activities		Planned	Results (November 2021) PCR
4-1	To develop syllabus and training materials for training on Aircraft Surveillance System Maintenance Services	Developed	Completed by November 2018
4-2	To attend OJT Instructor Training at EASA	2 CNS engineers attend OJT instructor training.	2 CNS engineers completed in June 2018
4-3	To conduct training on Aircraft Surveillance System Maintenance Services by DCA Instructor	At least 4 CNS engineers have completed training	7 engineers have completed training by DCA instructor
4-4	To conduct on-the-job training of Aircraft Surveillance System Maintenance Services at KIA by DCA Instructor	At least 4 CNS engineers have completed OJT training	7 engineers have completed training by DCA instructor

## 2. Achievements of the Project

### 2-1 Outputs and indicators

Through the implementation of the activities, project outputs were/are to be achieved.

#### (1) Output 1: DCA's capacity is developed to provide Radar Control Services at KIA.

Output 1 has been archived at the end of the Project, because all indicators under Output 1 have been fulfilled.

[Achievement of each indicator]

- 1) At least 10 ATC officers have successfully completed Radar Control training at EASA.
  - In total, twelve (12) ATC officers have completed Radar Control Training at EASA in Kenya (6 in 2017 and 6 in 2018).
  - However, three (3) participants have already retired from KIA. Two have been assigned to airports other than KIA and not able to operate Radar (One is assigned in Mzuzu airport, and one is assigned in Chileka airport).

Table 1: Training to achieve Output 1-1

	Training Course title	Institution	date	duration	Instructor	Participant
1	Basic Radar Air Traffic Control (Group 1)	EASA	19th Jun – 27th Oct 2017	19 weeks	EASA Instructor	6
2	Basic Radar Air Traffic Control (Group 2)	EASA	15th Jan – 25th May 2018	19 weeks	EASA Instructor	6

- 2) AIRAC on new Radar Control Services has been issued.
  - New Radar completed the installation in September 2018. Then, seven (7) AIS officers participated in a one-day workshop by JICA expert (Mr. Oue) in October 2018.
  - However, flight inspection was delayed about one year because of financial issues facing DCA.

- During the preparation of AIRAC, thirteen (13) AIS officers received technical training on the new Radar Control Service by the JICA expert in March 2019.
- Finally, AIRAC on new Radar Control Services was issued after flight inspection in September 2019.

Table 2: Training to achieve Output 1-2

	Training Course title	Institution	date	duration	Instructor	Participant
1	AIS workshop	SOA	2nd October 2018	1 day	Oue	7 (AIS)
2	Radar Support Training for AIS	SOA	19th & 20th March, 2019	2 days	Oue	13 (AIS)

- 3) Standard Operation Procedures (SOP) for Radar Control Services have been developed.
- Malawi Air Traffic Standard (MATS) was drafted based on the international standard (PANS/OPS) by the Project's taskforce team following technical instruction from JICA expert (Mr. Diggins) in December 2017. MATS outlines all air traffic service standards, including Rader Control in Malawi, as Standard Operation Procedures (SOP) for Rader Control Services. Section 3 of the MATS outlines standards related to the operation of aircraft surveillance systems.
  - The drafted version of MATS was reviewed for update and briefed to five ATC officers (taskforce members) by JICA expert (Mr. Diggins) in June 2018.
  - The MATS was revised through training by JICA expert (Mr. Kubo) from October to November 2019 and issued a second version.
  - The task force members revised the MATS during the Project's suspended period caused by Covid-19 April 2020 to March 2021. The revised version was printed out as the third version of MATS in March 2021 using project funds.
  - MATS has been revised based on the revision of international standards periodically by the taskforce members.

Table 3: Training to achieve Output 1-3

	Training Course title	Institution	Date	Duration	Instructor	Participant
1	Standard Operation Procedures (SOP)/Malawi Air Traffic Standard (MATS) revision; briefing of guidelines	SOA	25th Nov. – 5th Dec. 2019	2 weeks	Kubo	5

- 4) At least 10 ATC officers have successfully completed simulator training on Radar Control Services under the guidance of JICA Expert.
- In total, twelve (12) ATC officers have completed simulator training on Radar Control Services under the guidance of JICA experts (Mr. Diggins and Mr. Kubo). All the participants were trained after completing basic training in EASA Kenya.
  - The training was provided four times from 2017 to 2018 (basic and enhanced basic training in 2017, advanced training in 2018).
  - One-week refresher training was also provided to seven (7) ATC officers among the twelve in 2019.
  - The simulator for air traffic services was provided to DCA through the previous JICA technical cooperation project.
  - Three of the participants have already retired from DCA.

Table 4: Training to achieve Output 1-4

	Training Course title	Institution	Date	duration	Instructor	Participant
1	Basic Radar Simulation Workshop	SOA	1st November - 17th November 2017	15 days	Diggins	6
2	Enhanced Basic Radar Simulation Workshop	SOA	20th November - 15th December 2017	25 days	Kubo	6
3	Advanced Radar Simulator Training	KIA	3rd October - 7th November 2018	25 days	Diggins	12
4	Radar Simulator Refresh Training (Simulator Review Training)	KIA	15th March - 22nd March 2019	1 week	Kubo	7

5) Three ATC officers have successfully completed OJT Instructor Training.

- Three (3) ATC officers completed OJT instructor training with two CNS engineers at EASA in Nairobi Kenya in June 2018.
- In total, four ATC officers have completed the OJT instructor training, including the one who participated in the training through the previous JICA technical cooperation project (2014-2016)

Table 5: Training to achieve Output 1-5

	Training Course title	Institution	Date	duration	Instructor	Participant
1	OJT Instructor Training Course	EASA	4th Jun 2018 – 8th Jun 2018	5 days	EASA Instructor	3

6) At least 10 ATC officers have successfully completed hands-on training of Aircraft Surveillance System test operation under the guidance of JICA Expert.

- Twelve (12) ATC officers who completed basic training at EASA, underwent a hands-on training as localized basic training on Radar Control Services by JICA expert (Mr. Diggins) from June to August 2018.
- JICA Expert, Mr. Diggins, implemented additional classroom training targeting eleven (11) of the twelve ATC officers in November 2018.
- JICA Expert (Mr. Diggins) provided follow-up training to seven (7) of the eleven ATC officers from March to April 2019 and was completed by all the 11 ATC officers.
- Finally, the Project confirms that ten (10) ATC officers have successfully completed the series of hands-on training on Aircraft Surveillance System test operation.

Table 6: Training to achieve Output 1-6

	Training Course title	Institution	Date	duration	Instructor	Participant
1	Theoretical Radar Control for ATC (Radar Theory & Application Course)	SOA	a. 25th June – 3rd August 2018 b. 27th August – 31st August 2018	a. 6 weeks b. 1 week	Diggins	12
2	Radar Control Theory for ATC beginners	SOA	8th November – 16th November 2018	1 week	Diggins	11
3	RADAR Control OJT (limited operation) at Kamuzu	KIA	2nd April – 17th May 2019	6 weeks	Diggins	7

International Airport					
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- 7) At least 15 ATC officers have successfully acquired a Radar Control Rating.
- Twelve (12) ATC officers have successfully acquired a Radar Control Rating after training at EASA and SOA. However, out of the 12 ATC officers above, three (3) have already retired from DCA.
  - Four (4) ATC officers will acquire the Radar Control Rating through training at SOA and OJT at KIA in December 2021.
  - Six (6) ATC officers are expected to acquire a Radar Control Rating after completion of OJT training by SOA OJT trainers in 2022.
  - In total, twenty-two (22) ATC officers are expected to acquire a Radar Control Rating in 2022.

**(2) Output 2: DCA's capacity is developed to train Radar Controllers at SOA.**

Output 2 has been achieved at the end of the Project, because all indicators under Output 2 have been fulfilled.

[Achievements of each indicator]

- 1) Syllabus and training materials for basic training on Radar Control Services have been developed.
  - JICA experts developed Training syllabus and textbook for basic training on Radar Control Services in November 2018. These training materials are developed based on ICAO 054 and finalized as a localized version for Malawi through training by JICA experts in 2019. (Refer to ANNEX2)
  - The final version was published and distributed in 2020.
- 2) At least 5 ATC officers have successfully completed basic training on Radar Control Services by SOA Instructor.
  - Training on Radar Control Services for new controllers (cadets) was implemented by DCA instructors from February to November 2020.
  - This training was scheduled to take place in South Africa in 2018 but was delayed due to financial issues affecting the DCA. Instead of holding it outside the country, the training was implemented at the SOA by four ATC officers trained as instructors by the Project. This training was initiated by SOA during the absence of JICA expert due to Covid-19.
  - In total, eleven (11) ATC officers (8 Cadets and 3 officers in Chilleka airport) completed basic Training on Radar Control Services as new operators) by SOA Instructors.

Table 7: Training to achieve Output 2-2

Training Course title	Institution	Date	duration	Instructor	Participant
ATC Radar Control Training for Cadets (Radar Control Theory)	SOA/ KIA	3 Feb.-21Feb. 2020 (Group1) 3 Aug. - 18 Aug. 2020 (Group 2) 19 Oct. - 11 Nov. 2020 (Group 3)	6 weeks	DCA Instructors (ATC Officer)	11

- 3) At least 5 ATC officers have successfully completed simulator training on Radar Control Services by SOA Instructor.
  - After the installation of the Radar, simulator operation training was provided to ATC officers by the manufacturer (NEC) from September to October 2018.



- The simulator training on Radar Control Services was implemented to the twelve (12) ATC officers who completed basic training in SOA by DCA instructors from February to October 2020. Training for Group 2 was suspended from 4 April to 6 July 2020 due to Covid-19.
- Training for Group 2 and 3 have been ongoing as a part of training by OJT instructors with the guidance of JICA experts from October to November 2021.
- Finally, twelve (12) new controllers (9 Cadets and 3 officers at Chileka airport) will complete simulator training on Radar Control by SOA Instructors.

Table 8: Training to achieve Output 2-3

	Training Course title	Institution	Date	duration	Instructor	Participant
1	Simulator Operation Training	KIA	1st September 2018 – 2nd September 2018	2 days	NEC	3
2	MSDPS* Function Training for ATC (MSDPS* Manufacture Training Course)	KIA	3rd September – 2nd October 2018	4weeks	NEC	12
3	ATC RADAR Control OJT Training for Cadets (Simulator Training)	SOA/KIA	24 Feb. - 3 Apr. (suspend from 4 Apr. – 6 Jul. due to Covid-19)/7 Jul. – 31 Jul. 2020 (Group1) 19 Aug. - 16 Oct. 2020 (Group2) 12 Oct – 5 Nov. 2021 (Group3, as a part of training by OJT instructors)		DCA Instructors (ATC Officer)	11

- 4) At least 5 ATC officers have successfully completed on-the-job training of Radar Control Services by KIA OJT Instructor.
- On-the-job training of Radar Control Services has been ongoing targeting new controllers by KIA OJT Instructors with the guidance of JICA expert (Kubo).
  - This training is implemented as OJT training for four (4) OJT instructors (ATC officers who completed instructor training by the Project). It was also implemented as refresher training for the participants after a pause of project activities due to Covid-19.
  - In total, nine (9) ATC officers are expected to complete the training as new controllers for Radar by the end of the Project.

Table 9: Training to achieve Output 2-4

	Training Course title	Institution	Date	duration	Instructor	Participant
1	ATC RADAR Approach Training - On-The-Job Training for Group-1&2 - Simulator Training for Group 3	SOA/KIA	15th September – 5th November 2021	2 weeks× 3groups	Kubo +DCA instructors (Linda, Frederick, Dennis, Harris)	8

**(3) Output 3: DCA's capacity is developed to maintain the aircraft surveillance system at KIA.**

Output 3 has been achieved at the end of the Project, because all indicators under Output 3 have been fulfilled.

[Achievement of each indicator]

- 1) At least 3 CNS engineers have successfully completed basic trainings on radar maintenance services

at EASA.

- Four (4) CNS engineers completed the training at EASA Kenya in 2018.
- However, none of the four (4) CNS engineers above is expected to work on radar maintenance after 2022. Two of them have already retired (one in 2020 and one in 2021). One will retire in December 2021. The fourth is away from radar maintenance because he is assigned to Chileka Airport. The fourth continues to instruct maintenance of the Radar to new Task-force temporarily. Finally, five engineers were accepted as instructors for the task force team.

Table 10: Training to achieve Output 3-1

	Training Course title	Institution	Date	Duration	Instructor	Participant
1	SSR (Secondary Surveillance Radar) & ADS-B maintenance course	EASA	15th Jan 2018 – 9th Mar 2018	8 weeks	EASA Instructor	4

- 2) Standard Maintenance Procedures (SMP) for Aircraft Surveillance System at KIA have been developed
  - 1st draft of Standard Maintenance Procedures SMP was developed through the training to CNS engineers in October 2018 by manufacturer instructor and JICA expert (Mr. Batacan).
  - The SMP will be updated with the recording sheet in November 2021.
  - The basic version (selected contents) was published and placed in the radar site and equipment room. Detail versions were distributed to CNS engineers (training participants) via USB memory and DVD
  - All the items will be listed as 'index' and compiled for user-friendly preparation in one Disk in October 2021.
- 3) At least 3 CNS engineers have successfully completed on-the-job training of Aircraft Surveillance System Maintenance Services by the manufacturer
  - Seven (7) CNS engineers have completed on-the-job Training by the manufacturer (NEC) after installing the Aircraft Surveillance System between September and November 2018.
  - In addition, theoretical training with localized technologies was provided to the seven engineers by JICA expert (Batacan) in September 2018. Follow-up training was also implemented from April to May 2019.
  - In total, seven (7) CNS engineers completed on-the-job training, although two of the seven engineers have already retired.

Table 11: Training to achieve Output 3-3

	Training Course title	Institution	Date	Duration	Instructor	Participant
	Theoretical MSDPS Training for CNS	KIA	3rd September – 14th September 2018	2 weeks	NEC	7
	ADS-B Theoretical Lecture for CNS	KIA	17th September 2018 – 24th September 2018	1 week	NEC	7
	SSR/MSDPS Maintenance Training for CNS	KIA	25th September – 12th October 2018	2 weeks	NEC	7
	Radar Remote/Local maintenance Training for CNS	KIA	15th October – 23rd November 2018	5 weeks	NEC	7
	Theoretical Radar Maintenance for CNS	SOA	2nd July 2018 – 31st August 2018	9 weeks	Batacan	7
	Radar Maintenance on-the-job training	KIA	15th April-16th May 2019	4weekd	Batacan	7

**(4) Output 4: DCA's capacity is developed to train Aircraft Surveillance System Maintenance Engineers at SOA.**

Output 4 has been archived at the end of the Project, because all indicators under Output 4 have been fulfilled.

[Achievement of each indicator]

- 1) Syllabus and training materials for training on Aircraft Surveillance System Maintenance Services have been developed.
  - 1st version of training material was developed in October 2018.
  - All the items will be listed as 'index' and compiled for user-friendly preparation in one Disk in October 2021
  
- 2) Two CNS engineers have successfully completed OJT Instructor Training.
  - Two (2) CNS engineer instructors completed OJT Instructor Training at EASA in Kenya June 2018.
  - However, one of the two CNS engineers above has already retired. And the other plans to retire by the end of this year (2021), just after termination of the Project.
  - As the replacement of the instructors (out of scope of the Project), the SOA plans to implement instructor training targeting 2 CNS engineers in December 2021.

Table 12 Training to achieve Output 4-2

	Training Course title	Institution	Date	duration	Instructor	Participant
1	OJT Instructor Training Course	EASA	4th Jun – 8th Jun 2018	5 days	EASA Instructor	2

- 3) At least 4 CNS engineers have successfully completed training on Aircraft Surveillance System Maintenance Services by DCA Instructor.
  - Refresher training was implemented to seven (7) CNS engineers by a CNS engineer (Mr. Chisale) who was trained as an instructor by the project. This was under the initiative of the SOA during the absence of JICA experts due to covid-19. Mr. Chisale has retired from the DCA.
  - The SOA also plans to implement training by a CNS engineer (Mr. Betenigo) who was trained as an instructor by the project in November 2021 before his retirement in December 2021.

Table 13: Training to achieve Output 4-3

	Training Course title	Institution	Date	Duration	Instructor	Participant
1	CNS Refresher Training	SOA	18 <sup>th</sup> January – 5 <sup>th</sup> February 2021	3 weeks	DCA(Chisale)	7
2	Equipment Management Training	SOA	Planned in 3 <sup>rd</sup> week of November 2021	1-2 days	DCA (Betenigo)	5

- 4) At least 4 CNS engineers have successfully completed on-the-job training of Aircraft Surveillance System Maintenance Services by DCA Instructor.
  - On-the-job training is implemented five (5) CNS engineers by a CNS instructor (Mr. Nyrenda) who

received basic radar training at EASA in Kenya under the guidance of JICA expert (Mr. Batacan).

- This training is also OJT instructor training for Mr. Nyrenda.

Table 14: Training to achieve Output 4-4

Training Course title	Institution	Date	duration	Instructor	Participant
Maintenance on-the job training	KIA	Planned 25 Oct - 19 November 2021	4 weeks	Batacan+ DCA instructor (Nyrenda)	5

## 2-2 Project Purpose and indicators

Project Purpose: DCA operates and maintains an aircraft surveillance system.

### Indicators

1. DCA has been providing Radar Control Services in accordance with Standard Operation Procedures (SOP).
2. DCA has been maintaining an aircraft surveillance system at KIA following Standard Maintenance Procedures (SMP).

### Important Assumptions

- Trained ATC officers continue to work in DCA
- Trained CNS engineers continue to work in DCA

The Project Purpose is evaluated as fully achieved at the end of the Project. However, there are some concerns about those achievements in terms of sustainability.

[Reason of judgment and achievement of indicators]

- The majority of indicators have been fulfilled (See table 15).
- There are significant outcomes produced by the project for the capacity development of DCA regarding operation and maintenance of Radar Control Services, such as
  - ATC officers and CNS engineers were developed through various training opportunities provided by the Project.
  - Internal capacity development system has been established through instructor training and development of training materials (see Figure 1).
- However, the project is required to take actions to remove important assumptions for the achievement (see table 16), such as:
  - [Retirement and transfer of trained officers/engineers] It can influence the sustainability of the capacity of DCA if any actions are not taken. Development of new instructors, completion of new recruits, and
  - [Accessibility of materials produced by the Project]. The Project developed various materials, such as Standard procedures (SOP and SMP) and training materials for operation (ATC) and maintenance (See ANNEX 2 for list). The quality is appreciated by the users in DCA. However, its accessibility, is not good enough for the users' convenience. Project is needs to compile them in a more user-friendly environment.

(The project recommends installing a laptop computer or a tablet at the maintenance center for search & reference of technical information from the materials. Because the technical information includes a technical manual, it has thousands of pages).

Table 15: Fulfillment of each indicator (Project Purpose)

Indicator	Achievement
1. DCA has been providing Radar Control Services in accordance with Standard Operation Procedures (SOP).	<ul style="list-style-type: none"> <li>◆ MATS has been developed as SOP for Radar Control Services. It can be periodically updated by ATC officers.</li> <li>◆ SOP for the aircraft surveillance system in KIA will be developed by a working team (out of Project's scope).</li> <li>◆ Sixteen (16) ATC officers have acquired a rating for Radar Control Services, and 6 others will do in early 2022. The number is enough for DCA to operate an aircraft surveillance system in the shift in accordance with the SOP.</li> </ul>
2. DCA has been maintaining an aircraft surveillance system at KIA in accordance with Standard Maintenance Procedures (SMP).	<ul style="list-style-type: none"> <li>◆ SMP was developed. A summary is printed out and stored in the maintenance room and Radar site. Detailed part of the manual is distributed to each engineer in USB memory.</li> <li>◆ The ongoing training by JICA experts will ensure the capacity of its users (CNS engineers) from October to November 2021.</li> <li>◆ In total, 9 engineers received training (4 in Kenya, 5 at the SOA) and 6 are currently performing maintenance of aircraft surveillance systems as a team in accordance with SMP. Five (5) of the six (6) engineers will receive refresh training by JICA experts to help ensure their ongoing capacity for radar maintenance.</li> </ul>

Table 16: Influence of Important Assumptions

Important Assumption	Influence
• Trained Officers continue to work in DCA	• Three (3) among twelve (12) ATC officers trained in Kenya have already retired. Two (2) ATC officers have been assigned for duty away from KIA (one in Chileka and the other in Mzuzu).
• Trained engineers continue to work in DCA	<ul style="list-style-type: none"> <li>• Two (2) (among 4) trained in Kenya have already retired, and another will retire this year.</li> <li>• One (1) is posted away from the aircraft surveillance system (in Chileka).</li> <li>• Five mid-career engineers who have received training and have been working in the field have started working as instructors for the next generation.</li> </ul>

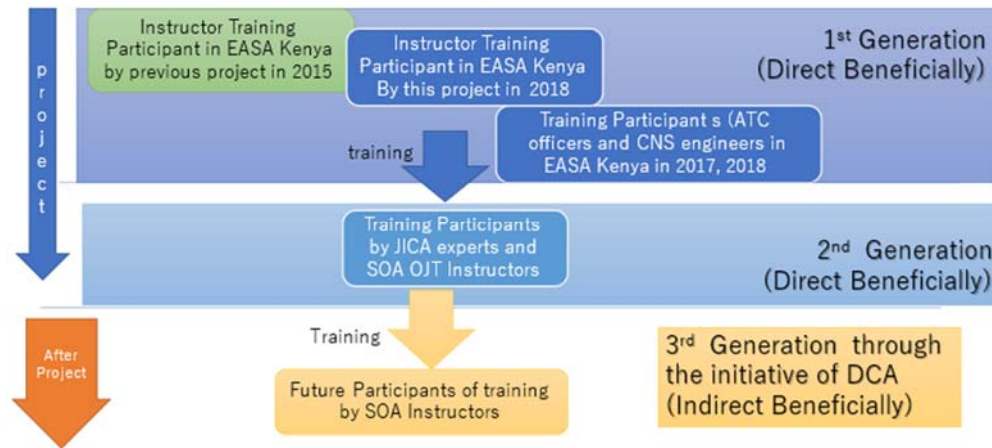


Figure 1 Internal capacity development system established by the Project

### 3. History of PDM Modification

The Project's PDM was updated two times officially from ver.0 (R/D) to ver.3-1.0 (current one). There were minor changes for duration.

Table 17: History to PDM Modification

Amendment No.	Modification of PDM and Amendment of R/D
First Amendment, 11 October 2019	<ul style="list-style-type: none"> <li>Duration of the Project was extended from 30 months to 42 months (until the end of November 2020) due to delay of flight inspection for Radar Commissioning and training of the newly recruited ATCs at ATNS</li> </ul>
Second Amendment, 28 October 2020	<ul style="list-style-type: none"> <li>Duration of the Project was extended from 42 months to 54 months (until the end of November 2021) due to the global spread of the coronavirus disease (COVID-19)</li> </ul> <p>While some of the Project activities had been able to continue online, some activities such as Outputs 2-4 and 4-4, required to be done in face-to-face to archive the Project purpose as well as not to jeopardize the safety of air transportation services. Therefore, the extension of the Project period was necessary in order to dispatch JICA experts after the restriction was lifted.</p>

### 4. Others

#### 4-1 Results of Environmental and Social Considerations

Radar control reduces the holding time for the aircraft to approach and can advise more shorter, direct routes. As a result, the project contributes to the reduction of CO2 emission.

#### 4-2 Results of Considerations on Gender/Peace Building/Poverty Reduction

- Gender is considered in the selection of Counterpart and training participants. Thirty percent of the training participants were women. Compared to other Malawi sectors, the female participant's rate of the Project was high.
- Positive participation of female counterparts enhances their opportunity in DCA. For example, a task force member was promoted to become the principal of the SOA.

### III. Results of Joint Review

#### 1. Results of Review based on DAC Evaluation Criteria

##### (1) Relevance

Relevance refers to the extent to which the intervention of objectives and design respond to beneficiaries, global, country, and institutional needs, policies, priorities and will continue to do so if circumstances do not change.

Relevance of the Project is high.

[Selection of Target]

- Capacity Development of DCA's Operation and Maintenance was highly required because of the installation of a new Aircraft Surveillance System through Japanese Grant Aid in Malawi.
- Safe operation of Aircraft Surveillance System is important especially for KIA which is the main airport of the landlocked country, Malawi.

[Priority]

- Project is consistent with Malawi's development policy, Malawi Vision 2063, which covers Economic Infrastructure in Enabler 6.

[Suitability of Means]

- Major activities are capacity development training targeting ATC officers for operation and CNS engineers for maintenance of the Aircraft Surveillance System.
- Training components were matched to the needs of the participants because training materials, including syllabuses, were developed based on the ICAO 054 and adapted to the local situation in Malawi.
- The selection of training participants from ATC as an operator and CNS as a maintenance technician was relevant. However, the selection criteria of some participants were not highly relevant because the retirement age of individuals was not considered well.
- Japan had a technological advantage for the Project, because of its continuous support to KIA.

##### (2) Coherence

Coherence means the compatibility of the intervention with other interventions in a country, sector, or institution.

Coherence of the Project is high.

[Consistency with Japanese Policy]

- ♦ The Project is covered in 'Development of infrastructures for climate change and urbanization, one of the periodized sectors of JICA's country-specific program to Malawi
- ♦ The Project also enhances the achievement of SDG 9 (Industry, Innovation, and Infrastructure).

[Collaboration with other Cooperation]

- ♦ The main target of the Project is DCA's capacity development in operation and maintenance of the Aircraft Surveillance System, which was installed through a Japanese Grant Aid. This technical cooperation project and the Grant Aid project are closely related and produce a synergy effect to achieve both projects.
- ♦ The Project cooperates with JOCV activities in terms of science and mathematics education. It arranged field visits of JOCV s' students to KIA. Enhancement of STEM (Science, Technology, Engineering and Mathematics) is one of JICA's priority sectors in Malawi.
- ♦ Airport Safety and Security Equipment Project is ongoing by European Investment Bank (EIB). EIB is funding the procurement of safety equipment such as fire trucks at Kamuzu International Airport. Both

Projects have shared information concerning each Project.

[Consistency with International Frameworks and Policies]

- The project supported DCA to get AIRAC on the new Radar Control Services and to pass Radar Commissioning Examination by ICAO.
- The Project developed the Standard Operation Procedures for the operation of the Aircraft Surveillance System based on PAN/OPS and localized to Malawi.
- Training Materials were developed in accordance with the standard syllabus by ICAO 054.

### **(3) Effectiveness**

Effectiveness means the extent to which the intervention achieved, or is expected to achieve, its objectives and its results, including any differential results across groups.

Effectiveness of the Project is relatively high.

[Achievement of Project Purpose]

- ◆ Project Purpose has been achieved by the end of project (see Chapter II, 2-2).

[Causal Relationship between Outputs and Project Purpose]

- ◆ All the Outputs are mutually related and produce synergy effects. For example, Output 1 and 3 are capacity development of officers/engineers and Output 2 and 4 are capacity development of DCA's internal technical development, which also enhance the capacity of SOA.

[Influencing Factors]

- ◆ Long term relationship between DCA and JICA positively influenced to achievement of the Project, such as mutual understanding, equipment and human resources supported by previous cooperation.
- ◆ Reduction of the number of inbound flights due to Covid-19 reduced the effectiveness of OJT training for ATC officers.

### **(4) Efficiency**

Efficiency refers to the productivity of the implementation process, examining if the inputs of the Project have been effectively converted into the outputs.

Efficiency of the Project is moderate.

[Achievement of activities]

- Project was extended by as much as 24 months due to external factors such as the delay of flight inspection of the new Aircraft Surveillance System and Covid-19.
- The Project implemented the majority of the activities as planned in the revised PO (see ANNEX 1-1) in accordance with the revised timing.

[Achievement of input]

- Input from Japanese side is expert, equipment and cost. They were implemented as planned in their items and amount (See Chapter II, 1-1).
- Input from the Malawi Government side is counterpart personnel and office space. They were implemented based on R/D. However, the assignment of counterpart personnel as input by the Malawi Government side was slightly difficult because of the extension of the project period, PD, PM, and two Coordinators have been replaced. Some task force members both in ATC and CNS were also replaced. Some counterparts who received capacity development abroad have retired. (See Chapter II, 1-2).

[Efficiency of input]

- Additional cost caused by the extension is limited according to the calculation by the Project caused by an additional approx. 11 MM for expert.



- Although the timing of input was delayed in accordance with the extension of the Project period, it was input based on the revised schedule (PO).
- All the planned inputs by Japan side were implemented regardless of the extension of the project period.
- Extension of the Project period caused only limited influence on the Project's cost, such as additional cost for refresher training to engineers by JICA expert.
- Assignment of counterpart personnel as input by Malawi side was influenced by the extension of the project, such as Transfer of PD, PM, Coordinators and Retirement of Training participants
- Project's cost is moderate compared to other projects in terms of the amount.
- There were some actions such as the equipment installed by the staff themselves instead of the contractor taken to save the Project's cost by stakeholders.

## **(5) Impact**

Impact means the extent to which the intervention has generated significant positive or negative, intended or unintended, higher-level effects.

Impact of the Project is high.

[Unexpected Impact]

- Positive impact
  - The development of DCA's knowledge enhanced the capacity of SOA through the improvement of training capacity, materials, and instructors.
    - ✧ SOA has started providing its original training targeting both DCA staff and outside personnel.
    - ✧ SOA is acknowledged as training institution which provides radar simulation training by the international regional program by EU.
  - Improvement of reliability on KIA's safety by starting Radar control service has increased KIA's income from inbound and overflight traffic.
  - Capacity development through the Project has produced a good opportunity for female officers' empowerment in terms of technical improvement and promotion in DCA.
- Negative impact
  - None

## **(6) Sustainability**

Sustainability refers to the extent to which an implementing agency can further develop the Project, and the benefits generated by the Project can be sustained under the recipient country's policies, technology, systems and financial state.

Sustainability of the Project is relatively high.

[Institutional side]

- ◆ Support to Operation and maintenance of Radar Control Service is covered by Malawi's development policy, Malawi Vision 2063.
- ◆ There are minor concerns about retirement and/or transfer of trained officers and instructors. As a result, DCA will also maintain its institutional support to the Radar Control Service such as starting to recruit new engineers process and filling the vacant executive position.

[Financial side]

- Maintenance cost is secured by DCA. The Project manager is the Airport Commandant who used to be the chief of CNS and is currently the decision-maker about KIA's budget.
- Additional income from the Aircraft Surveillance System is one of the income sources for its

maintenance cost.

[Technical]

- DCA has technical capacity enough to operate and maintain the ATS even after the Project ends
  - ATC including operation of Radar and internal training is satisfactory.
  - CNS is also capable of internal refresher training.

## **2. Key Factors Affecting Implementation and Outcomes**

### **(1) Desirable Effects**

#### **a) Continuous Relationship between DCA and JICA**

Since the first technical cooperation started in 1993, JICA and DCA have a long history of cooperation. Outcomes and relationships established through the cooperation enhanced the achievement of the Project.

- Good Communication and deep mutual understanding between JICA Project and DCA counterparts.
- Assignment of Project Counterpart (such as airport commandant of KIA) and JICA expert (chief advisor) who understand well about the background information and procedures (history) of the Project.
- Facilities and equipment were best used because of that cooperation, especially the airport radar simulator.

#### **b) Significant Impact of Radar**

Additional income has been produced to DCA from the airport traffic system. The significant impact enhanced the achievement of the Project. It is also expected to become an enhancing factor to achieve the Overall Goal and maintain the sustainability.

#### **c) Additional activities initiated by DCA**

Some activities which are not in the scope but beneficial to the Project, have been initiated by DCA. Such as:

- Development of SOP for Radar in KIA by working group members
- Implementation of capacity development training targeting staff and outsiders by instructors trained by the Project in SOA.

### **(2) Undesirable Effects**

#### **a) Delay of equipment installation and Radar Commissioning check (Flight Inspection) of the new Radar system through JICA grant aid**

The system planned for completed installation by October 2018, but was actually completed on 6 September 2019 due to a delay in commissioning check because of budgetary issues of the Malawi Government side and mechanical failure of an aircraft for flight inspection.

#### **b) Delay of Basic (Aerodrome) ATC Certification of new ATC staff**

Acquisition of Basic (Aerodrome) ATC Certification for 11 new ATC staff was delayed due to a delay of Basic ATC training at ATNS Training Center in South Africa, because of budgetary issues of the Malawi side.

#### **c) Retirement of important personnel**

5 out of 16 training participants in Kenya and 3 instructors retired during the Project.

#### **d) Covid-19 pandemic**

Due to outbreak of Covid-19 pandemic in early 2020, some of the Project activities were suspended. In addition, the Malawi Government suspended the operation of the airports from April 2020 to June 2020. The Project period was accordingly extended, which lowered the efficiency of the Project.

### **3. Evaluation of the results of the Project Risk Management**

Actions taken against undesirable effects were as follows:

- a) Delay of equipment installation and Radar Commissioning check (Flight Inspection) of the new Radar system through JICA grant aid  
Although it could not be officially operated, JICA experts and DCA have proceeded with possible training based on a provisional agreement with the manufacturer and DCA.
- b) Delay of Basic ATC Certification of new ATC staff  
DCA accelerated to dispatch to the basic training in South Africa and the advance training in Malawi was postponed.
- c) Retirement of important personnel  
DCA rehired retirees for a year and started the process of recruiting 6 new staff in 2021 and expected to start duty in early 2022
- d) Covid-19 pandemic  
During the absence of JICA experts (from April 2020 to April 2021), the Project activities were implemented under the initiation of Malawian counterparts. DCA have maintained its ownership of the Project through these initiatives.
  - Technical training to ATC officers and CNS engineers at SOA (Output 2-3, 2-4, 4-3).
  - Revision of SOP (MATS) by taskforce members.

### **4. Lessons Learned**

Following lessons are learned from project implementation and management.

#### **(1) Technical Transfer**

[Selection Criteria]

- The selection of senior staff as training participants in Kenya has reduced the effectiveness and sustainability of the Project, because three of twelve ATC officers and three of four CNS engineers have (or will have) already retired from DCA.
- Participants' age needs to be included in the selection criteria with other important criteria, such as technical capacity, willingness to become an instructor (TOT).

[Training Component]

- Basic knowledge about maintenance will strengthen technical skills for ATC operators
- Training materials are required to be distributed in a useful format. The main training text was distributed as a book, but other relevant technical information was distributed by the USB memory because of a huge number of pages. USB memory is not useful for participants who do not have access to a personal computer.

**(2) Project management**

- The presence of long-term experts would help ensure frequent communication between Japanese and Malawi sides.

## IV. For the Achievement of Overall Goals after the Project Completion

### 1. Prospects to achieve Overall Goal

Overall Goal: DCA sustainably to provide radar control services as published in Aeronautical Information Publication, and improve safety and reliability of air transportation services in Malawi.

*Indicator:*

1. *Radar control services have been provided for at least 95% of the published period of the radar control services in year 2022\*.*

*Important Assumptions:*

- *DCA continuously recruits staff for ATC and CNS engineering.*
- *DCA secures the budget for training of ATC officers and CNS engineers.*
- *DCA secures the budget for maintenance of CNS systems.*

DCA is expected to achieve its Overall Goal in 2024 if it can maintain its internal capacity development system established by the Project.

- ◆ Since it started its operation in 2019, DCA sustainably provides radar control services as published in Aeronautical Information Publication, and improve safety and reliability of air transportation services in Malawi. This proves that the DCA's capacity to fulfill the indicator.
- ◆ However, maintaining the current capacity of ATC operators and CNS engineers can affect that achievement. Recruitment of new staff needs be considered for that achievement.
- ◆ The Project has developed internal capacity development system on operation and maintenance of the Aircraft Surveillance System in DCA. However, some trained instructors have already retired. In order to strengthen the system, the SOA needs to train additional instructors.

### 2. Plan of Operation and Implementation Structure of the Malawi side to achieve Overall Goal

Through the joint monitoring meeting, DCA shared the following plan.

- 1) Implementation of instructor (TOT) training targeting ATC officers and CNS engineers who completed technical training by the Project in SOA. The training is planned in December 2021.
- 2) Recruitment of new officers and engineers.
- 3) Refresher theoretical training and additional OJT training of technical skills is required for the training participants who are assigned outside of KIA. Invitation of training participants as instructors from the other airport, such as Chileka Airport.

### 3. Recommendations for the Malawi Government side

In order to ensure the sustainability of the Project achievements and to achieve Overall Goal, the following actions are recommended to DCA.

- 1) Implementation of instructor (TOT) training by the SOA.

- 2) Proceed with recruiting new officers, especially engineers and AIS officers, because of the lack of young /middle-aged staff.
- 3) Improvement of selection criteria for future training participants

**ANNEX 1: Results of the Project(List of Dispatched Experts, List of Counterparts, List of Training, etc.)**

1-1 PO with initial plan, modified and actual

1-3 Input from Japanese side: (1) List of Dispatched Experts, (2) List of Equipment, (3) C/P Training in the third country (Japanese cost)

1-4 Input from Malawi side: (1) List of Counterparts, (2) Office Space, (3) List of Local cost, (4) List of training in the third country (Malawi's cost)

1-5 List of Training Course in Malawi

**ANNEX 2: List of Products (Report, Manuals, Handbooks, etc.) Produced by the Project**

2-1 Standard Procedures

2-2 Training Materials

**ANNEX 3: PDM (All versions of PDM)**

## **ANNEX-1**

### **Result of the Project**





## **ANNEX 1: Result of the Project**

**1 PO (Plan of Operation)**





OUTPUT														Y/MM	'17/4	5	6	7	8	9	10	11	12	'18/1	2	3	4	5	6	7	8	9	10	11	12	'19/1	2	3	4	5	6	7	8	9	10	11	12	'20/1	2	3	4	5	6	7	8	9	10	11	12	'21/1	2	3	4	5	6	7	8	9	10	11	12	'22/1	2	3	4	5	6	7	8	9	10	11	12	'23/1	2	3	4	5	6	7	8	9	10	11	12	'24/1	2	3	4	5	6	7	8	9	10	11	12	'25/1	2	3	4	5	6	7	8	9	10	11	12	'26/1	2	3	4	5	6	7	8	9	10	11	12	'27/1	2	3	4	5	6	7	8	9	10	11	12	'28/1	2	3	4	5	6	7	8	9	10	11	12	'29/1	2	3	4	5	6	7	8	9	10	11	12	'30/1	2	3	4	5	6	7	8	9	10	11	12	'31/1	2	3	4	5	6	7	8	9	10	11	12	'32/1	2	3	4	5	6	7	8	9	10	11	12	'33/1	2	3	4	5	6	7	8	9	10	11	12	'34/1	2	3	4	5	6	7	8	9	10	11	12	'35/1	2	3	4	5	6	7	8	9	10	11	12	'36/1	2	3	4	5	6	7	8	9	10	11	12	'37/1	2	3	4	5	6	7	8	9	10	11	12	'38/1	2	3	4	5	6	7	8	9	10	11	12	'39/1	2	3	4	5	6	7	8	9	10	11	12	'40/1	2	3	4	5	6	7	8	9	10	11	12	'41/1	2	3	4	5	6	7	8	9	10	11	12	'42/1	2	3	4	5	6	7	8	9	10	11	12	'43/1	2	3	4	5	6	7	8	9	10	11	12	'44/1	2	3	4	5	6	7	8	9	10	11	12	'45/1	2	3	4	5	6	7	8	9	10	11	12	'46/1	2	3	4	5	6	7	8	9	10	11	12	'47/1	2	3	4	5	6	7	8	9	10	11	12	'48/1	2	3	4	5	6	7	8	9	10	11	12	'49/1	2	3	4	5	6	7	8	9	10	11	12	'50/1	2	3	4	5	6	7	8	9	10	11	12	'51/1	2	3	4	5	6	7	8	9	10	11	12	'52/1	2	3	4	5	6	7	8	9	10	11	12	'53/1	2	3	4	5	6	7	8	9	10	11	12	'54/1	2	3	4	5	6	7	8	9	10	11	12	'55/1	2	3	4	5	6	7	8	9	10	11	12	'56/1	2	3	4	5	6	7	8	9	10	11	12	'57/1	2	3	4	5	6	7	8	9	10	11	12	'58/1	2	3	4	5	6	7	8	9	10	11	12	'59/1	2	3	4	5	6	7	8	9	10	11	12	'60/1	2	3	4	5	6	7	8	9	10	11	12	'61/1	2	3	4	5	6	7	8	9	10	11	12	'62/1	2	3	4	5	6	7	8	9	10	11	12	'63/1	2	3	4	5	6	7	8	9	10	11	12	'64/1	2	3	4	5	6	7	8	9	10	11	12	'65/1	2	3	4	5	6	7	8	9	10	11	12	'66/1	2	3	4	5	6	7	8	9	10	11	12	'67/1	2	3	4	5	6	7	8	9	10	11	12	'68/1	2	3	4	5	6	7	8	9	10	11	12	'69/1	2	3	4	5	6	7	8	9	10	11	12	'70/1	2	3	4	5	6	7	8	9	10	11	12	'71/1	2	3	4	5	6	7	8	9	10	11	12	'72/1	2	3	4	5	6	7	8	9	10	11	12	'73/1	2	3	4	5	6	7	8	9	10	11	12	'74/1	2	3	4	5	6	7	8	9	10	11	12	'75/1	2	3	4	5	6	7	8	9	10	11	12	'76/1	2	3	4	5	6	7	8	9	10	11	12	'77/1	2	3	4	5	6	7	8	9	10	11	12	'78/1	2	3	4	5	6	7	8	9	10	11	12	'79/1	2	3	4	5	6	7	8	9	10	11	12	'80/1	2	3	4	5	6	7	8	9	10	11	12	'81/1	2	3	4	5	6	7	8	9	10	11	12	'82/1	2	3	4	5	6	7	8	9	10	11	12	'83/1	2	3	4	5	6	7	8	9	10	11	12	'84/1	2	3	4	5	6	7	8	9	10	11	12	'85/1	2	3	4	5	6	7	8	9	10	11	12	'86/1	2	3	4	5	6	7	8	9	10	11	12	'87/1	2	3	4	5	6	7	8	9	10	11	12	'88/1	2	3	4	5	6	7	8	9	10	11	12	'89/1	2	3	4	5	6	7	8	9	10	11	12	'90/1	2	3	4	5	6	7	8	9	10	11	12	'91/1	2	3	4	5	6	7	8	9	10	11	12	'92/1	2	3	4	5	6	7	8	9	10	11	12	'93/1	2	3	4	5	6	7	8	9	10	11	12	'94/1	2	3	4	5	6	7	8	9	10	11	12	'95/1	2	3	4	5	6	7	8	9	10	11	12	'96/1	2	3	4	5	6	7	8	9	10	11	12	'97/1	2	3	4	5	6	7	8	9	10	11	12	'98/1	2	3	4	5	6	7	8	9	10	11	12	'99/1	2	3	4	5	6	7	8	9	10	11	12	'00/1	2	3	4	5	6	7	8	9	10	11	12
Sub-Activity														Hand-over of Aircraft Surveillance System ▲												▲Inauguration of Radar Control Services												Responsibility Organization	Achievements	Issues & Countermeasures																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
<b>Output 1: Capacity Development in Radar Control Services at KIA</b>																										<b>Activity Restriction by COVID-19</b>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
A-1 To attend training on Radar Control Services at EASA														(1st Group 6 ATCO)												(2nd Group 6 ATCO)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
A-1.1 Selection of Trainees																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-1.2 Preparations prior to dispatch of trainees																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-1.3 Training at EASA																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-2 To develop air-space plan with Radar Control Services																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
A-2.1 To collect current information and data for Airspace Planning																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-2.2 To acquire specifications for the New Radar System																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-2.3 To examine geographical features of KIA and its surroundings																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-2.4 To develop new airspace plan																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-2.5 To revise the Simulator Map																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-2.6 To issue AIP and publicize on AIRAC																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-3 To develop Standard Operation Procedures (SOP) for Radar Control Services																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
A-3.1 To obtain the latest PANS/ATM																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-3.2 To develop the New ATC Standard Operation Procedure Manual																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-4 To conduct simulator training on Radar Control Services under the guidance of JICA Expert																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
A-4.1 To update Simulator Map																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-4.2 To develop ATC Simulation Scenario																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-4.3 To conduct simulator training on Radar Control Services																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-5 To attend OJT Instructor Training at EASA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
A-5.1 To attend OJT Instructor Training at EASA/ATNS																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-6 To provide Radar Control Service rating																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
A-6.1 To discuss Air Traffic Control Service Certification and Licensing Procedure																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-6.2 To develop Certification and Rating Test																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-7 To conduct Radar Control test operation for hands-on training of ATC officers under the guidance of JICA Expert																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
A-7.1 To conduct Radar Control Test Operation																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
A-8 To monitor Radar Control Services and amend SOP as necessary																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
A-8.1 To amend ATC SOP Manual																																						JICA	DCA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				





## 2 Input from Japanese Side

### (1) Assignment of JICA Expert

	Name	Position in the project	Period of Assignment	M/M
1	Mr. Hiroshi MIZUMASA	Chief Advisor / ATC Training Manager	6 Jun. - 18 Aug. 2017 25 Oct. (2017) - 7 Jan. 2018 28 Feb. -13 Mar. 2018 31 May. - 10 Aug. 2018 24 Aug. - 4 Dec. 2018 20 Feb. - 20 May. 2019 14 Aug. - 15 Sep. 2019 30 Oct. - 18 Dec. 2019 9 Apr. - 4 Jun. 2021 10 Sep. - 30 Nov. 2021	21.0 M/M (630 Days)
2	Mr. Daniel DIGGINS	Radar Control Service	25 Jun. - 15 Jul. 2017 27 Oct. - 18 Nov. 2017 12 Jun. - 5 Aug. 2018 23 Aug. - 17 Nov. 2018 22 Mar. - 19 May. 2019	8.17 M/M (245 days)
3	Mr. Masakazu KUBO	Simulator Training	12 Nov. - 17 Dec. 2017 10 Mar. - 25 Mar. 2019 19 Nov. - 8 Dec. 2019 10 Sep. - 7 Nov. 2021	4.37 M/M (131 days)
4	Mr. Reynaldo BATAKAN	Radar Maintenance Service	28 Jun. - 27 Nov. 2018 7 Apr. - 20 May. 2019 18 Oct. - 28 Nov. 2021	7.97 M/M (239 days)
5	Mr. Yuji OUE	AIRAC Advisor	25 Sep. - 7 Oct. 2018 14 Mar. - 30 Mar. 2019	1.00 M/M (30 days)
6	Ms. Mariko HOMMA	Project Evaluator	22 Sep. - 8 Oct. 2021 9 Oct. - 14 Oct. 2021	0.57 M/M (Japan 0.25 M/M)
7	Ms. Takako SAITO	Project Coordinator	7 Jun. - 21 Jul. 2017	1.5 M/M
		Local Coordinator	22 Jul. - 10 Dec. 2018 10 Jan. 2019 - 4 Jun, 2021 27 Aug. - 30 Nov. 2021	42.00 M/M

### (2) List of equipment provided

No.	Name of Item	Specification	Qty.	Place of Installation
1	Laptop Computer / HP	15AU091NR/4GB/500GB	11	School of Aviation
2	Microsoft Office	MS Office Academy (Install PC)	11	School of Aviation
3	Multi-Function Copy Machine /	Copy/Print/Collor Scan Gestetner MP2501	1	School of Aviation
4	A3 Inkjet Printer /	CANON IX6830	2	School of Aviation

5	Network Cable/Equipment	WiFi Router Category 6 Lan cable	1	School of Aviation
6	LCD Projector	Epson EB-1785W/Slim Type/220v	1	School of Aviation
7	Projector Screen	Retractable roll-up screen	3	School of Aviation
8	UPS (Uninterrupted Power System)	5KVA/96v/100AH	1	School of Aviation
9	Maintenance free Battery for UPS	16 x 100Ah/12V	40	School of Aviation
10	SECURITY ALARM SYSTEM	Infrared Moving detector	1	School of Aviation
11	Surge Protector for Ethernet/	OLA-PT1000 for LAN Cable	3	School of Aviation
12	Emergency ATC VHF Radio Unit	Dual Channel ATC Transceiver 8W	1	ATC Tower KIA

(3) Training in the third countries

	course title	Duration	Number of Participants	Names of Participants (C/P)
1	Basic Radar Air Traffic Control(G1)	19th Jun 2017 – 27th Oct 2017	6	1. Fredrik Lyton Chisepeya 2. Janet Mphande 3. Dennis Telephorus Zamaere 4. Harris Marcus Kanje 5. Timothy E. Kamanga 6. Linda Manondo
2	Basic Radar Air Traffic Control(G2)	15th Jan 2018 – 25th May 2018	6	1. Shadreck Chipinga 2. Shadreck Sumani 3. Patricia Mwafulirwa 4. Alex Jabu 5. Gift Matewere 6. Chikondi Chadza
3	SSR (Secondary Surveillance Radar) & ADS-B maintenance course	15th Jan 2018 – 9th Mar 2018	4	1. Clement Betenigo 2. Mzondi Nyirenda 3. Frederick Nyanda Chisale 4. Lloyd Tiyezge Gondwe
4	OJT Instructor Training Course	4th Jun 2018 – 8th Jun 2018	5	1. Dennis Telephorus Zamaere 2. Harris Marcus Kanje 3. Linda Manondo 4. Clement Betenigo 5. Frederick Nyanda Chisale



### 3 Input from Malawi Side

#### (1) Assignment of Counterparts (As of October 2021)

	Name	Job Title	Position in the project	Duration
<b>PD and PM, Coordinator</b>				
1	Mr. James Chakwera	Director of Civil Aviation	Project Director (P/D)	Mar 2019 -Present
2	Mr. Alfred Mtilatila	Director of Civil Aviation	Project Director (P/D)	Jun 2017 – Mar 2019
3	Mr. Patrick Mmodzi	Deputy Director of Civil Aviation	Project Manager	Aug 2019-Oct 2020
4	Mr. Sidey Galafa	Principal, School of Aviation	Co-project Manager	Jun 2017- Jun 2018
5	Ms. Linda Manondo	Principal, School of Aviation	Co-project Manager	Sep 2018 - Present
6	Mr. Macletcher Bongwe	Airport Commandant KIA	Co-project Manager	Jun 2017 – Aug 2018
7	Mr. Donny Chimtengo	Airport Commandant KIA	Co-project Manager	Aug 2018 – Sep 2020
8	Mr. Macletcher Bongwe	Airport Commandant KIA	Co-project Manager	Sep 2020 - Present
9	Mr. Donny Chimtengo	Chief Air Traffic Services	Project Coordinator	Sep 2020 - Present
10	Mr. R. Kanunkha	Chief Telecommunications Engineer	Project Coordinator	Jun 2017-Present
<b>Taskforce Members (Radar Control Service)</b>				
1	Mr. F. Chisepeya	Chief Air Traffic Controller	ATC Taskforce	Jan 2021 – Present
2	Mr. A. Jabu	Chief Air Traffic Controller	ATC Taskforce	Jun 2018 – Nov 2020
3	Mr. D. Zamaere	Air Traffic Controller	ATC Taskforce	Jun 2017 - Present
4	Mr. H. Kanje	Air Traffic Controller	ATC Taskforce	Jun 2018 – Present
5	Mr. T. Kamanga	Air Traffic Controller	ATC Taskforce	Jun 2017 – Present
6	Ms. J. Mphande	Air Traffic Controller	ATC Taskforce	Jun 2017 – Present
7	Ms. L. Manondo	Air Traffic Controller	ATC Taskforce	Jun 2017 – Sep 2018
<b>Taskforce Members (Radar Maintenance Service)</b>				
1	Mr. C. Betenigo	Chief Electronic Engineer (KIA)	CNS Taskforce	Jun 2017 – Present
2	Mr. F. Chisale	Electronic Engineer	CNS Taskforce	Jun 2017 – Apr 2021
3	Mr. L. Gondwe	Electronic Engineer	CNS Taskforce	Jun 2017 – Jul 2020
4	Mr. M. Nyirenda	Electronic Engineer	CNS Taskforce	Jun 2017 – Sep 2018
5	Mr. M. Nyirenda	Chief Electronic Engineer (CIA)	CNS Taskforce	Sep 2018 - Present

#### (2) Project Office Space

Office space for the Project was provided in School of Aviation (SOA), DCA

## (3) Local Cost, as of November 2021

Expenditure items	MWK
Project Office Utilities (Water & Electricity)	MWK 5,852,000
Project Fuel (for Project Minibus)	MWK 14,183,189
Counterpart Travel Allowance	MWK 13,295,000
Counterpart Ration	MWK 12,301,000
Radar Equipment Commissioning Cost	MWK 67,467,547

## (4) Training course in third country (ATNS, South Africa) by Malawi Fund

	course title	Duration	Number of Participants	Names of Participants
1	Approach control procedures (Basic ATC)	Group 1: 21st April – 15th June 2019  Group 2: 9th June – 2nd Aug 2019	11	1. Cosmas Jimson 2. Godfrey Mlenga 3. Henry Magombo 4. Charles Majawa 5. Wakisa Mwenelupembe 6. Edith Gamaliel 7. Michael Kachigwada 8. Aaron Ndalema 9. Towera Kamanga 10. Taona Kanunkha 11. Heston Munkhondya

## 4 List of Training Course in Malawi

	course title	date	Instructor	Number of Participants	Names of Participants
1	Basic Radar Simulation Workshop	1st November - 17th November 2017	Daniel Diggins	6	1. Fredrik Lyton Chisepeya 2. Janet Mphande 3. Dennis Telephorus Zamaere 4. Harris Marcus Kanje 5. Timothy E. Kamanga 6. Linda Manondo
2	Enhanced Basic Radar Simulation Workshop	20th November - 15th December 2017	Masakazu Kubo	6	1. Fredrik Lyton Chisepeya 2. Janet Mphande 3. Dennis Telephorus Zamaere 4. Harris Marcus Kanje 5. Timothy E. Kamanga 6. Linda Manondo

3	Theoretical Radar Control for ATC (Radar Theory & Application Course)	a. 25th June 2018 – 3rd August 2018 b. 27th August 2018 – 31st August 2018	Daniel Diggins	12	<ol style="list-style-type: none"> <li>1. Fredrik Lyton Chisepeya</li> <li>2. Janet Mphande</li> <li>3. Dennis Telephorus Zamaere</li> <li>4. Harris Marcus Kanje</li> <li>5. Timothy E. Kamanga</li> <li>6. Linda Manondo</li> <li>7. Shadreck Chipinga</li> <li>8. Shadreck Sumani</li> <li>9. Patricia Mwafulirwa</li> <li>10. Alex Jabu</li> <li>11. Gift Matewere</li> <li>12. Chikondi Chadza</li> </ol>
4	Theoretical Radar Maintenance for CNS	2nd July 2018 – 31st August 2018	Rey Batacan	9	<ol style="list-style-type: none"> <li>1. Clement Betenigo</li> <li>2. Mzondi Nyirenda</li> <li>3. Frederick Nyanda Chisale</li> <li>4. Lloyd Tiyezge Gondwe</li> <li>5. Alexandar Kennedy Kalilombe</li> <li>6. Deus Malaiza</li> <li>7. Sellina Khaila</li> <li>8. Velonica Chinseu</li> <li>9. Robinson Robert Chizimu</li> </ol>
5	Use of Flight Data Display Terminal Course	27th August 2018	Daniel Diggins	3	<ol style="list-style-type: none"> <li>1. Pontiuise Kalichero</li> <li>2. Jelia Kalinda</li> <li>3. Paul Lizimba</li> </ol>
6	Simulator Operation Training	1st September 2018 – 2nd September 2018	NEC Instructor	3	<ol style="list-style-type: none"> <li>1. Dennis Telephorus Zamaere</li> <li>2. Harris Marcus Kanje</li> <li>3. Linda Manondo</li> </ol>
7	MSDPS* Function Training for ATC (MSDPS* Manufacture Training Course)	3rd September – 2nd October 2018	NEC Instructor	12	<ol style="list-style-type: none"> <li>1. Fredrik Lyton Chisepeya</li> <li>2. Janet Mphande</li> <li>3. Dennis Telephorus Zamaere</li> <li>4. Harris Marcus Kanje</li> <li>5. Timothy E. Kamanga</li> <li>6. Linda Manondo</li> <li>7. Shadreck Chipinga</li> <li>8. Shadreck Sumani</li> <li>9. Patricia Mwafulirwa</li> <li>10. Alex Jabu</li> <li>11. Gift Matewere</li> <li>12. Chikondi Chadza</li> </ol>

8	Theoretical MSDPS Training for CNS	3rd September – 14th September 2018	NEC Instructor	8	<ol style="list-style-type: none"> <li>1. Mzondi Nyirenda</li> <li>2. Frederick Nyanda Chisale</li> <li>3. Lloyd Tiyezge Gondwe</li> <li>4. Alexandar Kennedy Kalilombe</li> <li>5. Deus Malaiza</li> <li>6. Sellina Khaila</li> <li>7. Velonica Chinseu</li> <li>8. Robinson Robert Chizimu</li> </ol>
9	ADS-B Theoretical Lecture for CNS	17th September 2018 – 24th September 2018	NEC Instructor	7	<ol style="list-style-type: none"> <li>1. Mzondi Nyirenda</li> <li>2. Frederick Nyanda Chisale</li> <li>3. Lloyd Tiyezge Gondwe</li> <li>4. Alexandar Kennedy Kalilombe</li> <li>5. Deus Malaiza</li> <li>6. Sellina Khaila</li> <li>7. Velonica Chinseu</li> </ol>
10	SSR/MSDPS Maintenance Training for CNS	25th September – 12th October 2018	NEC Instructor	7	<ol style="list-style-type: none"> <li>1. Mzondi Nyirenda</li> <li>2. Frederick Nyanda Chisale</li> <li>3. Lloyd Tiyezge Gondwe</li> <li>4. Alexandar Kennedy Kalilombe</li> <li>5. Deus Malaiza</li> <li>6. Sellina Khaila</li> <li>7. Velonica Chinseu</li> </ol>
11	AIS workshop	2nd October 2018	Yuji Oue	7	<ol style="list-style-type: none"> <li>1. Matthews Banda</li> <li>2. Sainani Chambo</li> <li>3. Elemess Kawerenga</li> <li>4. Robert Nkosi</li> <li>5. Nelson Kaliasi</li> <li>6. Mary Chirwa</li> <li>7. Nathan Kantechere</li> </ol>
12	Advanced Radar Simulator Training	3rd October 2018 – 7th November 2018	Daniel Diggins	12	<ol style="list-style-type: none"> <li>1. Fredrik Lyton Chisepeya</li> <li>2. Janet Mphande</li> <li>3. Dennis Telephorus Zamaere</li> <li>4. Harris Marcus Kanje</li> <li>5. Timothy E. Kamanga</li> <li>6. Linda Manondo</li> <li>7. Shadreck Chipinga</li> <li>8. Shadreck Sumani</li> <li>9. Patricia Mwafulirwa</li> <li>10. Alex Jabu</li> <li>11. Gift Matewere</li> <li>12. Chikondi Chadza</li> </ol>

13	Radar Remote/Local maintenance Training for CNS	15th October – 23rd November 2018	NEC Instructor	7	<ol style="list-style-type: none"> <li>1. Mzondi Nyirenda</li> <li>2. Frederick Nyanda Chisale</li> <li>3. Lloyd Tiyezge Gondwe</li> <li>4. Alexandar Kennedy Kalilombe</li> <li>5. Deus Malaiza</li> <li>6. Sellina Khaila</li> <li>7. Velonica Chinseu</li> </ol>
14	Radar Control Theory for ATC beginners	8th November – 16th November 2018	Daniel Diggins	11	<ol style="list-style-type: none"> <li>1. Cosmas Jimson</li> <li>2. Godfrey Mlenga</li> <li>3. Henry Magombo</li> <li>4. Charles Majawa</li> <li>5. Wakisa Mwenelupembe</li> <li>6. Edith Gamaliel</li> <li>7. Michael Kachigwada</li> <li>8. Aaron Ndalema</li> <li>9. Towera Kamanga</li> <li>10. Taona Kanunkha</li> <li>11. Heston Munkhondya</li> </ol>
15	Radar Simulator Refresh Training (Simulator Review Training)	15th March - 22nd March 2019	Masakazu Kubo	7	<ol style="list-style-type: none"> <li>1. Janet Mphande</li> <li>2. Dennis Telephorus Zamaere</li> <li>3. Timothy E. Kamanga</li> <li>4. Shadreck Sumani</li> <li>5. Patricia Mwafulirwa</li> <li>6. Alex Jabu</li> <li>7. Chikondi Chadza</li> </ol>
16	Radar Support Training for AIS	19th & 20th March, 2019	Yuji Oue	13	<ol style="list-style-type: none"> <li>1. Mattews Kamtotole Banda</li> <li>2. Sainani Chambo</li> <li>3. Elemess Kawerenga</li> <li>4. Alick Kachingwe</li> <li>5. Lugano Musopole</li> <li>6. Nathan Kantechere</li> <li>7. Innocent F Chikakuda</li> <li>8. Nelson Kaliasi</li> <li>9. Barkis Rodgers I Kalimacheuka</li> <li>10. Catherine Nazombo</li> <li>11. Taona Wisdom Mfuni</li> <li>12. Napoleon Mkandawire</li> <li>13. Mary Chirwa</li> </ol>
17	RADAR Control OJT (limited operation) at Kamuzu International Airport	2nd April – 17th May 2019	Daniel Diggins	7	<ol style="list-style-type: none"> <li>1. Janet Mphande</li> <li>2. Dennis Telephorus Zamaere</li> <li>3. Timothy E. Kamanga</li> <li>4. Shadreck Sumani</li> <li>5. Patricia Mwafulirwa</li> <li>6. Alex Jabu</li> <li>7. Chikondi Chadza</li> </ol>

18	Radar Maintenance on-the-job training	15th April-16th May 2019	Rey Batacan	8	<ol style="list-style-type: none"> <li>1. Mzondi Nyirenda</li> <li>2. Frederick Nyanda Chisale</li> <li>3. Lloyd Tiyezge Gondwe</li> <li>4. Alexandar Kennedy Kalilombe</li> <li>5. Deus Malaiza</li> <li>6. Sellina Khaila</li> <li>7. Velonica Chinseu</li> <li>8. Robinson Robert Chizimu</li> </ol>
19	Standard Operation Procedures (SOP)/Malawi Air Traffic Standard (MATS) revision; briefing of guidelines	25th Nov. – 5th Dec. 2019	Masakazu Kubo	5	<ol style="list-style-type: none"> <li>1. Alex Jabu</li> <li>2. Dennis Telesphorus Zamaere</li> <li>3. Timothy Ernest Kamanga</li> <li>4. Janet Tiyesie Mphande</li> <li>5. Linda Manondo</li> </ol>
20	ATC RADAR Control Training for Cadets (New Controllers)	3 Feb.- 3 Apr 2020 4 Apr. – 6 Jul 2020 Suspend due to Covid-19 7 Jul 2020 – ongoing	DCA Instructors (DCA staff trained as instructors in this project)	12	<ol style="list-style-type: none"> <li>1. Cosmas Jimson</li> <li>2. Godfrey Mlenga</li> <li>3. Henry Magombo</li> <li>4. Charles Majawa</li> <li>5. Wakisa Mwenelupembe</li> <li>6. Edith Gamaliel</li> <li>7. Michael Kachigwada</li> <li>8. Aaron Ndalema</li> <li>9. Towera Kamanga</li> <li>10. Taona Kanunkha</li> <li>11. Heston Munkhondya</li> <li>12. Hardwell Banda</li> </ol>
21	CNS Refresher	18th Jan - 5th Feb 2021	DCA Instructors (Chisale)	5	<ol style="list-style-type: none"> <li>1. A K Kalilombe</li> <li>2. E Kanyimbo</li> <li>3. R R Chizimu</li> <li>4. S Khaira</li> <li>5. V Chinseu</li> </ol>

22	Incident/Accident Handling Refresher Training	8th-11th February 2021	DCA Instructors (L Manondo, J Mphande, D Zamaere, H Kanje, F Chisepeya)	20	<ol style="list-style-type: none"> <li>1. Fredrick Chisepeya</li> <li>2. Harris Kanje</li> <li>3. Taona Kanunkha</li> <li>4. Cosmas Jimson</li> <li>5. Paul Lizimba</li> <li>6. Wakisa Mwenelupembe</li> <li>7. Patricia Mwalfurwa</li> <li>8. Jelia Kalinda</li> <li>9. Godfrey Mlenga</li> <li>10. Nelson Kaliasi</li> <li>11. Janet Mphande</li> <li>12. Dennis Zamaere</li> <li>13. Timothy Kamanga</li> <li>14. Aaron Ndalema</li> <li>15. Pontius Kalichero</li> <li>16. Charles Majawa</li> <li>17. Edith Gamariel</li> <li>18. Henry Magombo</li> <li>19. Towera Kamanga</li> <li>20. Chikondi Chadza</li> </ol>
23	Electro-Mechanic Refresher	15th Feb - 19th Feb 2021	DCA Instructors (Mtonga, Nkosi, Masamba)	7	<ol style="list-style-type: none"> <li>1. I Phiri</li> <li>2. B Kazembe</li> <li>3. E Chirwa</li> <li>4. H Lucius</li> <li>5. R Kandodo</li> <li>6. J Ntchima</li> <li>7. H Chakaka</li> </ol>
24	AIS Refresher	12th-23rd April 2021	DCA Instructors (E. Kawarenga, T.Kamanga, J Mphande, S Khaila, D Malaidza)	9	<ol style="list-style-type: none"> <li>1. Alick Kachingwe</li> <li>2. Lugano Musopole</li> <li>3. Napoleon Mkandawire</li> <li>4. Innocent F Chikakuda</li> <li>5. Mary Chirwa</li> <li>6. Catherine Nazombo</li> <li>7. Barkis Rodgers I Kalimacheuka</li> <li>8. Nathan Kantchere</li> <li>9. Taona Wisdom Mfuni</li> </ol>
25	ATC RADAR Approach OJT	15th September – 5th November 2021	Masakazu Kubo+ DCA instructors	8	<ol style="list-style-type: none"> <li>1. Wakisa Mwenelupembe</li> <li>2. Edith Gamaliel</li> <li>3. Michael Kachigwada</li> <li>4. Aaron Ndalema</li> <li>5. Towera Kamanga</li> <li>6. Taona Kanunkha</li> <li>7. Heston Munkhondya</li> <li>8. Hardwell Banda</li> </ol>

26	Radar Maintenance on- the-job training	25th October - 19th November 2021	Rey Batacan & DCA Instructor (Mzondi)	5	<ol style="list-style-type: none"> <li>1. Alexandar Kennedy Kalilombe</li> <li>2. Deus Malaiza</li> <li>3. Sellina Khaila</li> <li>4. Velonica Chinseu</li> <li>5. Robinson Robert Chizimu</li> </ol>
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## **ANNEX-2**

### **List of Products**



**ANNEX 2 List of Products**

**1. Standard Procedures**







ATC Rader Operation		CNS Rader Maintenance	
<b>SOP (Standard Operation Procedure) for ATC Controller</b>		<b>SMP (Standard Maintenance Procedure) for CNS Engineer</b>	
<p>SOP was produced as MATS (Malawi Air-Traffic System) Both published and stored on DVD</p> <p><i>For ATC Trainee / ATC Instructor / Training Administrator</i></p>		<p>SMP of Lilongwe Radar was produced based on the NEC Maintenance Manuals by the Book. Stored on DVD</p> <p><i>For Engineer Trainee / Engineer Instructor / Training Administrator</i></p>	

**2. Training Syllabus**

ATC Rader Operation		CNS Rader Maintenance	
<b>Syllabus and lesson Plan of the ATC Radar Control Training</b>		<b>Syllabus and lesson Plan of the General Radar Maintenance Training</b>	
<p>This was produced based on the ICAO TRAINAIR Course 054 Radar Approach Control.</p> <p>Both published as textbook and stored on DVD</p> <p><i>For ATC Instructor / Training Administrator</i></p>		<p>This was produced Based on the ICAO TRAINAIR General Radar Theoretical Course.</p> <p>Both published as textbook and stored on DVD</p> <p><i>For Engineer Instructor / Training Administrator</i></p>	

**3. Training Materials**

ATC Rader Operation		CNS Rader Maintenance	
<b>1) ATC Radar Control Training Course Material</b>		<b>1) General Radar Training Materials for CNS Radar Engineer</b>	
<p>Main component was published as textbook. Full version was stored in DVD</p> <p><i>For ATC Trainee / ATC Instructor / Training Administrator</i></p>		<p>This was developed based on the SARPs (Standards and Recommended Practices ICAO) and TRAINAIR standard syllabus.</p> <p>Stored in DVD.</p> <p><i>For Engineer Trainee / Engineer Instructor / Training Administrator</i></p>	

ATC Rader Operation		CNS Rader Maintenance	
<b>2) ATC Radar Control Training Course Material for Instructor</b>		<b>2) Lilongwe NEC RADAR Training Materials for CNS Radar Engineer</b>	
<p>This material contains:</p> <ul style="list-style-type: none"> <li>- Editable Power-Point File,</li> <li>- Achievement test,</li> <li>- Final Examination and Answer</li> <li>- Simulator Exercise scenarios</li> </ul> <p>Stored on DVD</p> <p>For ATC Instructor / Training Administrator</p>		<p>This was developed based on the NEC Maintenance &amp; Equipment Manual</p> <p>Stored on DVD.</p> <p>For Engineer Trainee / Engineer Instructor / Training Administrator</p>	
<b>3) ATC Radar Information Documents for Radar Control Training</b>		<b>3) Lilongwe NEC Radar Maintenance &amp; OJT Manuals</b>	
<p>This material contains:</p> <ul style="list-style-type: none"> <li>✓ Operation Manual for Radar Control System</li> <li>✓ Air Traffic Management from ICAO</li> <li>✓ Chart &amp; AIP for Malawi Airspace.</li> </ul> <p>Stored on DVD.</p> <p>For ATC Trainee / ATC Instructor / Training Administrator</p>		<p>This material is Maintenance with OJT manual.</p> <p>Both published as textbook and stored on DVD. Installed at Radar Site, Engineer work shop and Equipment Room at airport.</p> <p>For Engineer Trainee/ Engineer Instructor / Training Administrator.</p>	
		<b>4) Lilongwe NEC Radar Examination Material Question and Answer Sheets</b>	
		<p>This material is Question and Answer Sheets for Trainee</p> <p>Stored in DVD</p> <p>For Engineer Instructor / Training Administrator</p>	
		<b>5) Technical Information Documents for Surveillance from ICAO</b>	
		<p>This material contains:</p> <ul style="list-style-type: none"> <li>✓ ATSEP (Air Traffic Safety Electronics Personnel) Training Manual</li> <li>✓ Training and Assessment for Aircraft Operation Personnel.</li> <li>✓ Technical Document for SMGCS, VDL, Mode-S from ICAO</li> </ul> <p>Stored in DVD.</p> <p>For Engineer Trainee / Engineer Instructor / Training Administrator</p>	

## **ANNEX-3**

### **PDM (Project Design Matrix)**



## ANNEX 3: PDM (All Version of PDM)

## Project Design Matrix (PDM)

Project Title: The Capacity Development Project for Radar Air Navigation Services at Kamuzu International Airport

Version 0.0

Implementing Agency: Department of Civil Aviation (DCA)

Dated 28 November 2016

Target Group: Air Traffic Controllers, Electronic Engineers and Training Instructors of DCA

Period of the Project: 30 months

Project Site: Kamuzu International Airport (KIA) and School of Aviation (SOA)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<b>Overall Goal</b>			
DCA sustainably provides radar control services as published in Aeronautical Information Publication, and improve safety and reliability of air transportation services in Malawi.	1. Radar control services have been provided for at least 95% of the published period of the radar control services in year 2022.	- Survey	
<b>Project Purpose</b>			
DCA operates and maintains aircraft surveillance system	1: DCA has been providing Radar Control Services in accordance with Standard Operation Procedures (SOP). 2: DCA has been maintaining aircraft surveillance system at KIA in accordance with Standard Maintenance Procedures (SMP).	- Project Monitoring Sheet	- DCA continuously recruits staff for ATC and CNS engineering. - DCA secures the budget for training of ATC officers and CNS engineers. - DCA secures the budget for maintenance of CNS systems.
<b>Outputs</b>			
1: DCA's capacity is developed to provide Radar Control Services at KIA	1-1: At least 10 ATC officers have completed Radar Control training at EASA successfully. 1-2: AIRAC on new Radar Control Services have been issued. 1-3: Standard Operation Procedures (SOP) for Radar Control Services have been developed. 1-4: At least 10 ATC officers have successfully completed simulator training on Radar Control Services under the guidance of JICA Expert. 1-5: Three ATC officers have successfully completed OJT Instructor Training. 1-6: At least 10 ATC officers have successfully completed hands-on training of Aircraft Surveillance System test operation under the guidance of JICA Expert. 1-7: At least 15 ATC officers have successfully acquired Radar Control rating.	- Project Monitoring Sheet	- Trained ATC officers continue to work in DCA - Trained CNS engineers continue to work in DCA

<p>2: DCA's capacity is developed to train Radar Controllers at SOA</p>	<p>2-1: Syllabus and training materials for basic training on Radar Control Services have been developed.                  2-2: At least 5 ATC officers have successfully completed basic training on Radar Control Services by SOA instructor.                  2-3: At least 5 ATC officers have successfully completed simulator training on Radar Control Services by SOA Instructor.                  2-4: At least 5 ATC officers have successfully completed on-the-job training of Radar Control Services by KIA OJT Instructor.</p>		
<p>3: DCA's capacity is developed to maintain aircraft surveillance system at KIA</p>	<p>3-1: At least 3 CNS engineers have successfully completed basic trainings on radar maintenance services at EASA.                  3-2: Standard Maintenance Procedures (SMP) for Aircraft Surveillance System at KIA have been developed.                  3-3: At least 3 CNS engineers have successfully completed on-the-job training of Aircraft Surveillance System Maintenance Services by the manufacturer.</p>		
<p>4: DCA's capacity is developed to train Aircraft Surveillance System Maintenance Engineers at SOA</p>	<p>4-1: Syllabus and training materials for training on Aircraft Surveillance System Maintenance Services have been developed.                  4-2: Two CNS engineers have successfully completed OJT Instructor Training.                  4-3: At least 4 CNS engineers have successfully completed training on Aircraft Surveillance System Maintenance Services by DCA Instructor.                  4-4: At least 4 CNS engineers have successfully completed on-the-job training of Aircraft Surveillance System Maintenance Services by DCA Instructor.</p>		
<p><b>Activities</b></p>	<p><b>Inputs</b></p>		
<p>1. Capacity Development in Radar Control Services at KIA                  1-1: To attend training on Radar Control Services at EASA                  1-2: To develop air-space plan with Radar Control Services                  1-3: To develop Standard Operation Procedures (SOP) for Radar Control Services                  1-4: To conduct simulator training on Radar Control Services under the guidance of JICA Expert                  1-5: To attend OJT Instructor Training at EASA                  1-6: To provide Radar Control rating                  1-7: To conduct aircraft surveillance system test operation for hands-on training of ATC officers</p>	<p><b>Japanese Side</b></p> <p>Experts:                  - Chief Advisor/ATC Training Management                  - Radar Control Services Expert                  - Simulator Training Expert                  - Aircraft Surveillance System Maintenance Services Expert                  - Project Evaluator                  - Project Coordinator                  - Others as necessary</p> <p>Training Abroad:                  - Training on Radar Control</p>	<p><b>Malawian Side</b></p> <p>Counterparts:                  - Project Director (Director, DCA)                  - Project Manager (Deputy Director)                  - Co-Project Manager (Principal of SOA)                  - Radar Control Services Task Force                  - Aircraft Surveillance System Maintenance Services Task Force                  - Project Coordinators (Chief Air Traffic Control Officer, Chief Aeronautical Telecommunication Engineer and Principle Human Resource Management Officer)</p> <p>Project Office (with desks/chairs and internet connection):</p>	<p>- Counterpart personnel continue to engage in the Project throughout the project period.                  - DCA implements the Project with sufficient ownership.</p>



<p>under the guidance of JICA Expert 1-8: To monitor Radar Control Services and amend SOP as necessary</p>	<p>Services at EASA - Training on Radar Maintenance Services at EASA - OJT Instructor Training at EASA - Others as necessary</p>	<p>- SOA Facilities of DCA - SOA class rooms - ATC Simulator Training System - Aircraft Surveillance System Running Cost: - Operation and maintenance of ATC Simulator Training System - Operation and maintenance of Aircraft Surveillance System - Supply or replacement of machinery, equipment and materials necessary for the Project other than provided by JICA - In-country travel expenses per diem of DCA counterpart personnel - Travel expenses and training allowance of DCA counterpart personnel for training at SOA and KIA</p>	
<p>2. Capacity Development in Radar Controller Training at SOA 2-1. To develop syllabus and training materials for basic training on Radar Control Services 2-2. To conduct basic training on Radar Control Services by SOA Instructor 2-3. To conduct simulator training on Radar Control Services by SOA Instructor 2-4. To conduct on-the-job training of Radar Control Services by KIA OJT Instructor</p>	<p>Equipment: - Project office equipment - PCs for production of training materials - Project vehicle - Others as necessary</p>	<p>Data and Information related to the Project</p>	
<p>3. Capacity Development in Aircraft Surveillance System Maintenance at KIA 3-1. To attend training on radar maintenance services at EASA 3-2. To develop Standard Maintenance Procedures (SMP) for Aircraft Surveillance System at KIA 3-3. To attend on-the-job training of Aircraft Surveillance System Maintenance Services at KIA by the manufacturer 3-4. To monitor Aircraft Surveillance System Maintenance Services at KIA and amend SMP as necessary</p>			<p><b>Pre-conditions</b></p> <ul style="list-style-type: none"> <li>- The Project is supported by the Ministry of Transport and Public Works.</li> <li>- DCA secures budget for inputs of the Project</li> </ul>
<p>4. Capacity Development in Aircraft Surveillance System Maintenance Engineer Training at SOA 4-1. To develop syllabus and training materials for training on Aircraft Surveillance System Maintenance Services 4-2. To attend OJT Instructor Training at EASA 4-3. To conduct training on Aircraft Surveillance</p>			



<p>System Maintenance Services by DCA Instructor 4-4. To conduct on-the-job training of Aircraft Surveillance System Maintenance Services at KIA by DCA Instructor</p>			
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## Project Design Matrix (PDM)

**Project Title: The Capacity Development Project for Radar Air Navigation Services at Kamuzu International Airport**

**1st Amendment**

Implementing Agency: Department of Civil Aviation (DCA)

Dated: 11 October 2019

Target Group: Air Traffic Controllers, Electronic Engineers and Training Instructors of DCA

Period of the Project: 42 months

Project Site: Kamuzu International Airport (KIA) and School of Aviation (SOA)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<b>Overall Goal</b>			
DCA sustainably provides radar control services as published in Aeronautical Information Publication, and improve safety and reliability of air transportation services in Malawi.	1. Radar control services have been provided for at least 95% of the published period of the radar control services in year 2022.	- Survey	
<b>Project Purpose</b>			
DCA operates and maintains aircraft surveillance system	1: DCA has been providing Radar Control Services in accordance with Standard Operation Procedures (SOP). 2: DCA has been maintaining aircraft surveillance system at KIA in accordance with Standard Maintenance Procedures (SMP).	- Project Monitoring Sheet	- DCA continuously recruits staff for ATC and CNS engineering. - DCA secures the budget for training of ATC officers and CNS engineers. - DCA secures the budget for maintenance of CNS systems.
<b>Outputs</b>			
1: DCA's capacity is developed to provide Radar Control Services at KIA	1-1: At least 10 ATC officers have completed Radar Control training at EASA successfully. 1-2: AIRAC on new Radar Control Services have been issued. 1-3: Standard Operation Procedures (SOP) for Radar Control Services have been developed. 1-4: At least 10 ATC officers have successfully completed simulator training on Radar Control Services under the guidance of JICA Expert. 1-5: Three ATC officers have successfully completed OJT Instructor Training. 1-6: At least 10 ATC officers have successfully completed hands-on training of	- Project Monitoring Sheet	- Trained ATC officers continue to work in DCA - Trained CNS engineers continue to work in DCA

PDM 1<sup>st</sup> Amendment

	Aircraft Surveillance System test operation under the guidance of JICA Expert. 1-7: At least 15 ATC officers have successfully acquired Radar Control rating.		
2: DCA's capacity is developed to train Radar Controllers at SOA	2-1: Syllabus and training materials for basic training on Radar Control Services have been developed. 2-2: At least 5 ATC officers have successfully completed basic training on Radar Control Services by SOA Instructor. 2-3: At least 5 ATC officers have successfully completed simulator training on Radar Control Services by SOA Instructor. 2-4: At least 5 ATC officers have successfully completed on-the-job training of Radar Control Services by KIA OJT Instructor.		
3: DCA's capacity is developed to maintain aircraft surveillance system at KIA	3-1: At least 3 CNS engineers have successfully completed basic trainings on radar maintenance services at EASA. 3-2: Standard Maintenance Procedures (SMP) for Aircraft Surveillance System at KIA have been developed. 3-3: At least 3 CNS engineers have successfully completed on-the-job training of Aircraft Surveillance System Maintenance Services by the manufacturer.		
4: DCA's capacity is developed to train Aircraft Surveillance System Maintenance Engineers at SOA	4-1: Syllabus and training materials for training on Aircraft Surveillance System Maintenance Services have been developed. 4-2: Two CNS engineers have successfully completed OJT Instructor Training. 4-3: At least 4 CNS engineers have successfully completed training on Aircraft Surveillance System Maintenance Services by DCA Instructor. 4-4: At least 4 CNS engineers have successfully completed on-the-job training of Aircraft Surveillance System Maintenance Services by DCA Instructor.		
Activities	Inputs		
	Japanese Side	Malawian Side	
1. Capacity Development in Radar Control Services at KIA 1-1: To attend training on Radar Control Services at EASA 1-2: To develop air-space plan with Radar Control Services 1-3: To develop Standard Operation Procedures (SOP) for Radar Control Services 1-4: To conduct simulator training on Radar Control Services under the guidance of JICA Expert	Experts: - Chief Advisor/ATC Training Management - Radar Control Services Expert - Simulator Training Expert - Aircraft Surveillance System Maintenance Services Expert - Project Evaluator	Counterparts: - Project Director (Director, DCA) - Project Manager (Deputy Director) - Co-Project Manager (Principal of SOA) - Radar Control Services Task Force - Aircraft Surveillance System Maintenance Services Task Force - Project Coordinators (Chief Air Traffic Control Officer, Chief Aeronautical Telecommunication Engineer and	- Counterpart personnel continue to engage in the Project throughout the project period. - DCA implements the Project with sufficient ownership.

<p>1-5: To attend OJT Instructor Training at EASA  1-6: To provide Radar Control rating  1-7: To conduct aircraft surveillance system test operation for hands-on training of ATC officers under the guidance of JICA Expert  1-8: To monitor Radar Control Services and amend SOP as necessary</p>	<ul style="list-style-type: none"> <li>- Project Coordinator</li> <li>- Others as necessary</li> </ul> <p>Training Abroad:</p> <ul style="list-style-type: none"> <li>- Training on Radar Control Services at EASA</li> <li>- Training on Radar Maintenance Services at EASA</li> </ul>	<p>Principle Human Resource Management Officer)  Project Office (with desks/chairs and internet connection):</p> <ul style="list-style-type: none"> <li>- SOA</li> </ul> <p>Facilities of DCA</p> <ul style="list-style-type: none"> <li>- SOA class rooms</li> <li>- ATC Simulator Training System</li> <li>- Aircraft Surveillance System</li> </ul> <p>Running Cost:</p> <ul style="list-style-type: none"> <li>- Operation and maintenance of ATC Simulator Training System</li> <li>- Operation and maintenance of Aircraft Surveillance System</li> <li>- Supply or replacement of machinery, equipment and materials necessary for the Project other than provided by JICA</li> <li>- In-country travel expenses per diem of DCA counterpart personnel</li> <li>- Travel expenses and training allowance of DCA counterpart personnel for training at SOA and KIA</li> </ul> <p>Data and Information related to the Project</p>	
<p>2. Capacity Development in Radar Controller Training at SOA</p> <p>2-1. To develop syllabus and training materials for basic training on Radar Control Services</p> <p>2-2. To conduct basic training on Radar Control Services by SOA Instructor</p> <p>2-3. To conduct simulator training on Radar Control Services by SOA Instructor</p> <p>2-4. To conduct on-the-job training of Radar Control Services by KIA OJT Instructor</p>	<ul style="list-style-type: none"> <li>- OJT Instructor Training at EASA</li> <li>- Others as necessary</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>- Project office equipment</li> <li>- PCs for production of training materials</li> <li>- Project vehicle</li> <li>- Others as necessary</li> </ul>		
<p>3. Capacity Development in Aircraft Surveillance System Maintenance at KIA</p> <p>3-1. To attend training on radar maintenance services at EASA</p> <p>3-2. To develop Standard Maintenance Procedures (SMP) for Aircraft Surveillance System at KIA</p> <p>3-3. To attend on-the-job training of Aircraft Surveillance System Maintenance Services at KIA by the manufacturer</p> <p>3-4. To monitor Aircraft Surveillance System Maintenance Services at KIA and amend SMP as necessary</p>			
<p>4. Capacity Development in Aircraft Surveillance System Maintenance Engineer Training at SOA</p> <p>4-1. To develop syllabus and training materials for training on Aircraft Surveillance System Maintenance Services</p>			<p style="text-align: center;"><b>Pre-conditions</b></p> <ul style="list-style-type: none"> <li>- The Project is supported by the Ministry of Transport and Public Works.</li> <li>- DCA secures budget for inputs of the Project</li> </ul>

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| <p>4-2. To attend OJT Instructor Training at EASA</p> <p>4-3. To conduct training on Aircraft Surveillance System Maintenance Services by DCA Instructor</p> <p>4-4. To conduct on-the-job training of Aircraft Surveillance System Maintenance Services at KIA by DCA Instructor</p> |  |  |  |
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## Annex 1: Project Design Matrix (PDM)

**Project Title: The Capacity Development Project for Radar Air Navigation Services at Kamuzu International Airport**

**2nd Amendment**

Implementing Agency: Department of Civil Aviation (DCA)

Dated: 28 October 2020

Target Group: Air Traffic Controllers, Electronic Engineers and Training Instructors of DCA

Period of the Project: 54 months

Project Site: Kamuzu International Airport (KIA) and School of Aviation (SOA)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<b>Overall Goal</b>			
DCA sustainably provides radar control services as published in Aeronautical Information Publication, and improve safety and reliability of air transportation services in Malawi.	1. Radar control services have been provided for at least 95% of the published period of the radar control services in year 2022.	- Survey	
<b>Project Purpose</b>			
DCA operates and maintains aircraft surveillance system	1: DCA has been providing Radar Control Services in accordance with Standard Operation Procedures (SOP). 2: DCA has been maintaining aircraft surveillance system at KIA in accordance with Standard Maintenance Procedures (SMP).	- Project Monitoring Sheet	- DCA continuously recruits staff for ATC and CNS engineering. - DCA secures the budget for training of ATC officers and CNS engineers. - DCA secures the budget for maintenance of CNS systems.
<b>Outputs</b>			
1: DCA's capacity is developed to provide Radar Control Services at KIA	1-1: At least 10 ATC officers have completed Radar Control training at EASA successfully. 1-2: AIRAC on new Radar Control Services have been issued. 1-3: Standard Operation Procedures (SOP) for Radar Control Services have been developed. 1-4: At least 10 ATC officers have successfully completed simulator training on Radar Control Services under the guidance of JICA Expert. 1-5: Three ATC officers have successfully completed OJT Instructor Training. 1-6: At least 10 ATC officers have successfully completed hands-on training of	- Project Monitoring Sheet	- Trained ATC officers continue to work in DCA - Trained CNS engineers continue to work in DCA

PDM 2<sup>nd</sup> Amendment

	Aircraft Surveillance System test operation under the guidance of JICA Expert. 1-7: At least 15 ATC officers have successfully acquired Radar Control rating.		
2: DCA's capacity is developed to train Radar Controllers at SOA	2-1: Syllabus and training materials for basic training on Radar Control Services have been developed. 2-2: At least 5 ATC officers have successfully completed basic training on Radar Control Services by SOA Instructor. 2-3: At least 5 ATC officers have successfully completed simulator training on Radar Control Services by SOA Instructor. 2-4: At least 5 ATC officers have successfully completed on-the-job training of Radar Control Services by KIA OJT Instructor.		
3: DCA's capacity is developed to maintain aircraft surveillance system at KIA	3-1: At least 3 CNS engineers have successfully completed basic trainings on radar maintenance services at EASA. 3-2: Standard Maintenance Procedures (SMP) for Aircraft Surveillance System at KIA have been developed. 3-3: At least 3 CNS engineers have successfully completed on-the-job training of Aircraft Surveillance System Maintenance Services by the manufacturer.		
4: DCA's capacity is developed to train Aircraft Surveillance System Maintenance Engineers at SOA	4-1: Syllabus and training materials for training on Aircraft Surveillance System Maintenance Services have been developed. 4-2: Two CNS engineers have successfully completed OJT Instructor Training. 4-3: At least 4 CNS engineers have successfully completed training on Aircraft Surveillance System Maintenance Services by DCA Instructor. 4-4: At least 4 CNS engineers have successfully completed on-the-job training of Aircraft Surveillance System Maintenance Services by DCA Instructor.		
Activities	Inputs		<ul style="list-style-type: none"> <li>- Counterpart personnel continue to engage in the Project throughout the project period.</li> <li>- DCA implements the Project with sufficient ownership.</li> </ul>
	Japanese Side	Malawian Side	
1. Capacity Development in Radar Control Services at KIA 1-1: To attend training on Radar Control Services at EASA 1-2: To develop air-space plan with Radar Control Services 1-3: To develop Standard Operation Procedures (SOP) for Radar Control Services 1-4: To conduct simulator training on Radar	Experts: <ul style="list-style-type: none"> <li>- Chief Advisor/ATC Training Management</li> <li>- Radar Control Services Expert</li> <li>- Simulator Training Expert</li> <li>- Aircraft Surveillance System Maintenance Services</li> </ul>	Counterparts: <ul style="list-style-type: none"> <li>- Project Director (Director, DCA)</li> <li>- Project Manager (Deputy Director)</li> <li>- Co-Project Manager (Principal of SOA)</li> <li>- Radar Control Services Task Force</li> <li>- Aircraft Surveillance System Maintenance Services Task Force</li> <li>- Project Coordinators (Chief Air Traffic</li> </ul>	



<p>Control Services under the guidance of JICA Expert</p> <p>1-5: To attend OJT Instructor Training at EASA</p> <p>1-6: To provide Radar Control rating</p> <p>1-7: To conduct aircraft surveillance system test operation for hands-on training of ATC officers under the guidance of JICA Expert</p> <p>1-8: To monitor Radar Control Services and amend SOP as necessary</p>	<p>Expert</p> <ul style="list-style-type: none"> <li>- Project Evaluator</li> <li>- Project Coordinator</li> <li>- Others as necessary</li> </ul> <p>Training Abroad:</p> <ul style="list-style-type: none"> <li>- Training on Radar Control Services at EASA</li> <li>- Training on Radar Maintenance Services at EASA</li> </ul>	<p>Control Officer, Chief Aeronautical Telecommunication Engineer and Principle Human Resource Management Officer)</p> <p>Project Office (with desks/chairs and internet connection):</p> <ul style="list-style-type: none"> <li>- SOA</li> </ul> <p>Facilities of DCA</p> <ul style="list-style-type: none"> <li>- SOA class rooms</li> <li>- ATC Simulator Training System</li> <li>- Aircraft Surveillance System</li> </ul> <p>Running Cost:</p> <ul style="list-style-type: none"> <li>- Operation and maintenance of ATC Simulator Training System</li> <li>- Operation and maintenance of Aircraft Surveillance System</li> <li>- Supply or replacement of machinery, equipment and materials necessary for the Project other than provided by JICA</li> <li>- In-country travel expenses per diem of DCA counterpart personnel</li> <li>- Travel expenses and training allowance of DCA counterpart personnel for training at SOA and KIA</li> </ul> <p>Data and Information related to the Project</p>	
<p>2. Capacity Development in Radar Controller Training at SOA</p> <p>2-1. To develop syllabus and training materials for basic training on Radar Control Services</p> <p>2-2. To conduct basic training on Radar Control Services by SOA Instructor</p> <p>2-3. To conduct simulator training on Radar Control Services by SOA Instructor</p> <p>2-4. To conduct on-the-job training of Radar Control Services by KIA OJT Instructor</p>	<ul style="list-style-type: none"> <li>- OJT Instructor Training at EASA</li> <li>- Others as necessary</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>- Project office equipment</li> <li>- PCs for production of training materials</li> <li>- Project vehicle</li> <li>- Others as necessary</li> </ul>		
<p>3. Capacity Development in Aircraft Surveillance System Maintenance at KIA</p> <p>3-1. To attend training on radar maintenance services at EASA</p> <p>3-2. To develop Standard Maintenance Procedures (SMP) for Aircraft Surveillance System at KIA</p> <p>3-3. To attend on-the-job training of Aircraft Surveillance System Maintenance Services at KIA by the manufacturer</p> <p>3-4. To monitor Aircraft Surveillance System Maintenance Services at KIA and amend SMP as necessary</p>			
<p>4. Capacity Development in Aircraft Surveillance System Maintenance Engineer Training at SOA</p> <p>4-1. To develop syllabus and training materials for training on Aircraft Surveillance System</p>			<p style="text-align: center;"><b>Pre-conditions</b></p> <ul style="list-style-type: none"> <li>- The Project is supported by the Ministry of Transport and Public Works.</li> <li>- DCA secures budget for inputs of the Project</li> </ul>

Maintenance Services 4-2. To attend OJT Instructor Training at EASA 4-3. To conduct training on Aircraft Surveillance System Maintenance Services by DCA Instructor 4-4. To conduct on-the-job training of Aircraft Surveillance System Maintenance Services at KIA by DCA Instructor		
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