

Analysis of Departure Waiting Room Terminal Capacity on Passenger Volume at Patimura Ambon International Airport, Maluku Province

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Abstract

Departure terminal capacity to passenger volume at Patimura Ambon International Airport, Maluku Province in 2021 has experienced an increase in the number of passengers, won the Airport Service Quality (ASQ) award, in the airport category with a capacity of less than 2 million per year, from this statement the researcher wants to conduct a wide capacity analysis waiting room terminal, seating facilities, and passenger volume, whether the research results need development or not. The data in this study used secondary data, namely data on the number of passengers in the last three years, and primary data, namely data on the number of existing passenger departure terminal seats. Data analysis used descriptive statistical methods based on the formula in SKEP/347/XII/99, Director General of Civil Aviation. The results of the study stated that the area of the departure waiting room was 220 m² based on SKEP 77/VI/2005 Director General of Civil Aviation. The capacity of the departure waiting room at Gate-1 to gate-5, gates 1 and 2 can accommodate passengers, gate-3 = 271 passengers, gate-4 = 267 passengers and gate-5 = 247 passengers. The need for seats based on SKEP 77/VI/2005 Director General of Civil Aviation is 828 seats. The results of the analysis of the capacity of the Departure Waiting Room Terminal for Passenger Volume at Patimura Ambon International Airport, Maluku Province, were declared to be appropriate based on SKEP 77/VI/2005 of the Director General of Civil Aviation.

Keywords: Passenger Volume, Departure Waiting Room Capacity, Patimura Ambon International Airport, Maluku Province



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INTRODUCTION

All aspects of life, whether political, defense and security, as well as economic, social and cultural, depend on transportation. Land, air and sea travel all come under the transportation umbrella. The main choice for long trips, air transportation has several advantages over other transportation, as the most effective, efficient, fast, safe and comfortable mode of transportation. Therefore a good system is also accompanied by satisfactory facilities and infrastructure, and is built in order to obtain maximum results from the air transportation system. Airport or Airport as one of the service facilities in the aviation industry that serves the flow of aircraft traffic as well as the flow of incoming or outgoing passenger traffic. The more the number of planes that make landings and takeoffs, the greater the availability of a wider runway is needed, as well as the increasing number of crowded passengers from departure to arrival, a larger waiting room terminal is also needed as a complement to the required facilities. passengers before boarding the aircraft.

Patimura Ambon International Airport, Maluku Province, as the main gate for tourists to set foot on Maluku Island as one of the provinces in Indonesia and has a lot of natural and historical tourism potential. Pattimura Ambon International Airport, Maluku Province, also won the best airport certificate in the Asia Pacific region at the 2021 Airport Service Quality (ASQ) event, in the category of airports with a capacity of less than 2 million passengers per

year. The award was given at the 2021 Airport Service Quality (ASQ) Awards from the Airport Council International in Montreal, Canada, said General Manager of PT Angkasa Pura I, Pattimura Ambon International Airport Branch, Maluku Province, Pribadi Maulana said, this award was a form of international recognition for commitment excellent service at airports around the world which is assessed based on questionnaire calculations that give an overall satisfaction score at an airport in the past year in 2021 the increase in the number of passengers at Patimura Ambon International Airport, Maluku Province, increased by 20% compared to 2020. The prediction was also conveyed by the General Minister PT Angkasa Pura I (Persero) Patimura Ambon Airport Branch, Maluku Province. Private Maulana, the increase in the number of passengers that occurred in 2021 I am optimistic that in 2022 there will be an increase in passengers. According to him, this increase was due to the good conditions of the Covid-19 pandemic, the increase in the number of passengers began to be seen in mid-2021, it is known that data from Angkasa Pura I, the number of passengers at the beginning of 2021 had decreased during the Lebaran limit period for passengers arriving and departing were only 60 people, while in June 2021 the number of passengers began to increase until the end of the year in the 800s to 1500s per day (ambon.tribunnews.com).

Based on the predicted increase in the number of passengers in 2022, an evaluation must be carried out regarding the capacity of the waiting room terminal at Patimura Ambon International Airport. Based on SKEP/374/XII/1999 of the Director General of Civil Aviation, concerning Standards for Design and/or Engineering of Airport Facilities and Equipment, the area requirement for a passenger terminal is based on the number of passengers, the standard area of a room is usually calculated in units of area for each passenger. Then based on the Regulation of the Director General of Civil Aviation Number: SKEP/77/VI/2005 concerning Requirements for the Operation of Airport Engineering Facilities, discussing air side facilities are airports (runway, taxiway, apron) while airport land side facilities are (terminal building facilities), cargo terminal building facilities, airport supporting facilities operational building facilities).

While the researchers were conducting observational research from 01 August 2022 to 30 September 2022 at the Terminal Inspection Service (TIS) Unit at Patimura Ambon International Airport, Maluku Province, there were problems that occurred, including the capacity of the waiting room area of the departure terminal area (departure), the number of passengers and the number of seats does not match the operating airlines. For the large terminal capacity of the departure waiting room, it is desirable that gates three, four and five be put together to make it wider so that the use of the waiting room and infrastructure per gate is more evenly distributed and there is no wastage of electricity. then it is known that the number of passengers per day at Patimura Ambon International Airport is 755. Citilink, Batik Air and Sriwijaya Air have a total passenger capacity of 180, and ATR type aircraft operating during the day from 10:00 to 17:00 WIT. Then it is known that the number of passenger seats in the departure lounge area per gate is 164, the number of seats with the number of passengers also leads to delays in aircraft flight time delays which often occur due to operational problems and so on. In this case it is important that the capacity of the waiting room is bigger or unified and adjusted so that the addition of seats in the departure waiting room area is also more and the terminal inspection service staff can anticipate this problem. This was conveyed directly through the recording of the researcher's conversation with the terminal inspection service officer.

The purpose of this research is to find out the main issues as follows: Declare conformity or suitability of the size of the departure lounge terminal at Patimura Ambon International

Airport, Maluku Province, with the standards contained in SKEP/374/XII/1999 and SKEP/77/XII/99. Knowing the similarity of the number of passengers with the seats in the departure lounge area at Patimura Ambon International Airport, Maluku Province.

Theoretical Basis

Definition of Airport

Airports are defined in Annex 14 of ICAO (International Civil Aviation Organization) Airports as certain areas on land and waters (including structures, equipment and other goods) and are designed wholly, half of which are for departures, arrivals and aircraft movements. Law of the Republic of Indonesia Number 1 of 2009 in Article 1 Paragraph 33 concerning Aviation, that an airport is a certain place on land or waters within certain limits used for aircraft landing, taking off and boarding passengers, loading and unloading of goods, and a place for intra and intermodal transportation, which has the main safety and security equipment for aviation, as well as other infrastructure facilities. All buildings and equipment are classified as complementary, at least to be able to provide tools and infrastructure for air transportation to the public. Airport infrastructure for flight activities is divided into two types, namely land side facilities and air side facilities. The above infrastructure requires definite and regular regulations in order to be able to assist aircraft, passengers, as well as cargo so that services are safe, secure, smooth and comfortable. The air side includes runways, taxiways to aircraft parking (aprons), while land side activities are activities to serve the movement of passengers, goods/cargo, and land side facilities. (land side) others (ACRP 79,2012). The first component from the land side (air side) which is always related to airplane passengers is the passenger terminal, Sengtuvan et al (2006) said that the flow of passengers departing or arriving through several forms that occur at the terminal is the processor reservoir and link.

Capacity

Capacity is the most important measure in knowing the suitability level of an airport. As an airport planning design, capacity can be interpreted as the number of aircraft operations in a certain period and is related to the quality of the stopping value that can be obtained. Capacity can also be interpreted as the maximum aircraft operational level obtained and used at an airfield in each limited period when there is a request for continuous service and it always happens that the right aircraft takes off or lands. This definition is expressed as the ultimate capacity or maximum throughput of the route. Capacity analysis according to Ashford and Wright (1992), allows to design an airport determined by the level of runway required in knowing a suitable arrangement and to compare several design alternatives. The airport analysis is carried out in two directions: Estimating in fact the advantages of various parts of the airport system when handling passengers and aircraft flows. Considering the backwardness of the airport system, various invitation levels.

Airport Terminals

The airport terminal is the maximum amount of operation required and is assisted by service infrastructure within a limited period of time (Horonjeff, et al., 20011). The capacity of the land side of the passenger terminal is equalized through the movement of passengers to be controlled. Passenger capacity at the terminal is determined by the mass of procedures until the mass waits with the infrastructure available at the terminal. Facilities include curbside, check-in, security screening, departure waiting room and baggage claim, (Correia & Wirasinghe, 2013). The analysis of capacity at the airport is more dominant to the review of

the runway as one of the very first parts of the airport. The core of the problem being analyzed is the issue of cancellation of aircraft flights that apply at the time of take off and landing. Anderson, et al., (2000).

Airport Terminal Capacity

Capacity is the maximum number of accommodations for transitional activities for a certain time so that the level of efficiency can be determined. Based on SNI 03-7046-2004 concerning Airport Terminals confirms that the passenger terminal as a form of construction is used as an intermediary for forms of land transportation and forms of air transportation by accepting activities of exchanging access distances from land to aircraft or vice versa, procedures for passenger arrival and departure or transit and the transfer and movement of passengers and baggage from land to aircraft. The capacity of the Airport Terminal is also capable of handling operational, administrative and commercial activities, able to fulfill security, safety and flight operational qualifications, in addition to agreements and dealing with expansion issues.

Departure Waiting Room

Waiting room Based on Ministerial Decree No. 20 dated May 4, 2005, Regarding the Ratification of the Indonesian National Standard (SNI) 03-7046-2004 Airport Passenger Terminal as a Mandatory Standard, is a facility that functions as a waiting area for passengers before boarding an airplane. Waiting Room regarding the Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 132 of 2005, the terminal is an instrument that is usually used to manage arrivals and departures, raising and lowering people and/or goods, as well as switching modes of transportation. It can be concluded that the airport terminal itself is a connection between the airport where passengers and goods can move to modes of facilities that allow passengers to travel and leave the aircraft. In the draft regulation of the Minister of Transportation of the Republic of Indonesia Number PM 132 of 2015 Regarding the Management of Road Transport Passenger Terminals Chapter 5, articles 20 and 21, terminals according to the facilities provided are classified as: Main terminal, namely infrastructure that is ready and always available from the management and operation of the terminal. Supporting terminals, namely optional infrastructure that supports the management and operation of the terminal. The eligibility standards of a waiting room at the airport are: having infrastructure and administrative (fiscal and immigration) that has several licensed officers and must be ready and in the area at any time, it is required that it must have at least 1 counter to accommodate special users such as passengers who requires a wheelchair, to immigration distance to the distance between immigration desks/counters of at least 9m so that users can pass accordingly.

Volume

Based on the Regulation of the Director General of Civil Aviation Concerning Technical Instructions Civil Aviation Safety Regulations Section 8900-6.14 (Staff Instruction Part 8900-6.14) Concerning Flight And Duty Time Record Inspections. Confirming volume as a calculation of passengers how many departing and arriving passengers are known annually, as a form of national aviation database in order to achieve flight safety programs used the State/Safety Program (SSP) issued by the Directorate General of Civil Aviation, Ministry of the Republic of Indonesia. Based on the decision stated in Article 1 Enacting the Technical Instructions of the Civil Aviation Safety Regulations Section (Staff Instruction) regarding checking Operation and Flight (Trip) Record Inspection Flight operations records).

Passenger

Passengers According to the Regulation of the Minister of Transportation No: PM 49 of 2012 concerning Service Standards for economy-class passengers of domestic scheduled commercial air transportation article 1 paragraph 5 are people whose identity is on the ticket as seen from their correct identity documents and have a ticket or plane pass (Boarding passes). According to Law No. 22 of 2009 concerning Road Traffic and Transportation article 1 paragraph 25, a passenger is a person who is in a vehicle other than the driver and vehicle personnel. So, a passenger is someone or more who just rides on transportation such as planes, trains, buses, ships, or other types of transportation modes, but does not include employees who operate and service these modes of transportation. Such a passenger is too broad, so it can be said, the meaning of the definition of a passenger is a person (individual) or even more (group) who needs transportation services on a certain trip by providing a certain amount of money to buy tickets, where there is contact and agreement between the carrier and the passenger located at in the ticket, during the trip.

Relevant Research

Table 1. Relevant Research

No	Name	Year	Title	Research Result
1	Rio Nurdin, Hayuning Santa Asisi,Y.I Wicaksono, Bagus Hario Setiadji.	2017	Feasibility Analysis of Passenger Terminal I A Soekarno Hatta International Airport	<ol style="list-style-type: none"> 1. Forecasting results for 2024 show that passengers departing during peak hour are 2,943 passengers per hour and passengers arriving during peak hour are 3,189 passengers per hour. 2. The minimum check-in counters that must be provided to serve peak hour passengers in 2014 are 37 counters, while for 2024 there are 60 counters with a service time of 1.222 minutes per passenger. 3. The minimum baggage claim device that must be provided to serve peak hour passengers in 2014 is 7 pieces, while for 2024 there are 11 pieces. 4. The departure lounge can still serve peak hour passengers in 2014 and 2024 with the Level Of Service (LOS) category of Excellent Level Of Comfort.
2	Lita Yarlina	2012	Analysis of Passenger Terminal Capacity at PMB II Airport Palembang	<ol style="list-style-type: none"> 1. The passenger terminal capacity of Sultan Mahmud Badarudin II International Airport - Palembang is in the "medium" category. 2. The area of the departure hall needs to be added based on the calculations that are currently required 1320 m² while the existing one is only 104. 3. The results of forecasting the number of passengers using linear regression and time series data from the annual total number of passengers arriving and departing at Sultan Mahmud Badaruddin II Airport - Palembang, the average annual increase is only 174,631 people.
3	Putu Yudhya Pratam, I Gusti Raka Purbanto, I Wayan Suweda	2015	Analysis of Needs for Domestic Passenger Terminal Facilities at Ngurah Rai Airport Bali	<ol style="list-style-type: none"> 1. The stranding of stage III really needs to be done because the existing facilities in 2011 are no longer able to serve and accommodate passenger processing activities. 2. The results of calculating the need for facilities in the discussion explained that several departure terminal facilities had reached a saturation point such as the equipment area, departure hall, baggage claim area.

				<p>Meanwhile, the level of need for facilities in 2023 at the arrival terminal is in accordance with standard calculations, already in a saturated condition for the development of phase III</p> <p>3. Standard calculation of domestic passenger terminal facilities (departures) in 2023 can still accommodate and serve passengers. The saturation point for the domestic departure terminal area will occur in 2028. Meanwhile, the saturation point for the arrival terminal will occur in 2016</p>
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Research Methods

Research Design

In this research classified as descriptive quantitative research. Namely the quantitative data used to obtain the capacity and area of the departure waiting room terminal obtained from peak hour passenger volume data then describing or describing the data that has been obtained from Patimura Ambon International Airport. Descriptive analysis is used to find out descriptive data such as the mean value, minimum value, standard deviation and so on. According to Sugiyono (2004: 169) Descriptive analysis is statistics used to find out data by describing or describing the data that has been obtained as it is and does not aim to make decisions that take place mostly and generalize. According to Sugiyono (2017) the quantitative method is a definite method because it is based on the philosophy of positivism. As a factual rule, it is neutral because it has fulfilled rational instructions, namely tangible or proven, in fact, structured, and must be orderly.

Population

According to Sugiyono (2017) population is an area that generalizes, occurs from objects or subjects and has its own abilities and personality which are determined by someone as learning and then made a definite decision. The population in this study was at the same time with the sample. And the population in this study is also passenger volume activity data at Patimura Ambon International Airport.

Data Collection Technique

Data collection in this study was obtained from passenger volume data obtained from UPT Patimura Ambon International Airport for direct observation in order to obtain data on the number of available departure terminal seats at Patimura Ambon International Airport. Instruments used by researchers to obtain data such as:

1. Observation Method. Observing directly in the departure lounge area of Patimura Ambon International Airport so as to obtain data on the area of the waiting room, the number of passengers, and the number of seats available at Patimura Ambon International Airport.
2. Documentation Method. The type of data as a source of research data is obtained from documents that are collected, recorded and stored. Secondary data must be owned to obtain passenger volume data.

RESEARCH RESULTS AND DISCUSSION

The discussion and analysis in this study is slightly different from previous relevant research because this study will discuss departure waiting rooms, due to the absence of transfer or transit passengers in recent years. Transit and transfer passenger data is only needed to calculate some of the discussion points in SKEP/347/XII/199 issued by the Director General of Civil Aviation. Therefore the focus of the researcher's discussion is only on the

departure waiting room which does not require data on transfer passengers or transit passengers.

Analysis of Departure Waiting Room Area for Patimura Ambon International Airport, Maluku Province

The survey results at the departure lounge at Patimura Ambon International Airport obtained data to determine the area of the departure waiting room based on SKEP/77/VI/2005.

$$A = C - \frac{(u \cdot i + v \cdot k)}{30} m^2 + 10\%$$

Information:

- A = Area of Departure Waiting Room
- C = Number of passengers arriving at busy times
- u = Average longest wait (60 minutes)
- i = Proportion of passengers waiting the longest (0.6)
- v = Average waiting time for the fastest (20 minutes)
- k = Proportion of passengers waiting the fastest (0.4)

So the area of the departure lounge is:

$$\begin{aligned} A &= 220 - ((60 \times 0,6) + (20 \times 0,4)) + 10\% \cdot 30 \\ &= 220 - (1.46) m^2 + 10\% \\ &= 218.54 + 21,854 \\ &= 240.394 m^2 \\ &= 240 m^2 \end{aligned}$$

The area of the departure lounge currently owned by Patimura Ambon International Airport, Maluku Province, is 240 m². From these results it can be concluded that the area of the departure waiting room has completed the standard area based on SKEP/77/VI/2005 issued by the Director General of Civil Aviation and is also comfortable for passengers. The area of the waiting room is classified as a medium terminal based on the size of the terminal as seen from the table

Calculation Results of Waiting Room Area

Analysis of the capacity of the departure lounge for passengers at Patimura International Airport, Ambon, Maluku Province

The calculation of the capacity of the departure waiting room seen from the expected passenger standing dimensions is 2 m², knowing the capacity that can be served by the waiting room based on the existing condition table of the waiting room below as follows.

Table 2. Existing Conditions of Gate 1-5 Waiting Room

Chairs amount	820 x 5
Seat dimensions for Gate 1-5 models	27,6 6,343
Distance between seats	0.2 m ²
The area of the waiting room gate 1 - 5	929.63 30208 289.24 249.17
Standing dimensions per person	2 m ²

1. Area of Departure Waiting Room Gate 1 and 2

- a. Seating area (m^2); = number of seats (pieces) x seat dimensions model 1 (m^2)= $328 \times 27.6 = 9.5$
- b. Area between seats (m^2); = distance between seats x length of chair model 1 (m^2) x number of seats (pieces) = $0.2 \text{ m} \times 2.475 \times 328 = 162.36$
- c. Standing area (m^2); = area of waiting room (m^2) - area of seat model 1 (m^2) - area between seats (m^2)= $929.63 - 9.5 \text{ mm} - 162.36 = 757.77$
- d. standing capacity; standing area = $757.77 : 2 = 378.885$ standing dimensions.

So it can be concluded that the capacity served by the waiting room for gates 1 and 2 is = number of seats + standing capacity = $328 + 378 = 666$ passengers. So it can be seen that the gate 1 and gate 2 waiting rooms can serve 328 seated passengers and 378 standing passengers when there is an increase in the number of passengers during peak hours. Based on data on the number of passengers during peak hours, the currently available gate 1 and 2 waiting rooms are comfortable for passengers during peak hours.

2. Calculation of the Area of the Gate-3 Departure Waiting Room

- a. Seat area (m^2)= number of seats (pieces) x seat dimensions of model 2 (m^2)= $164 \times 6.343 = 1.04$
- b. Area between seats = distance between seats x length of chair model 1 (m^2) x number of seats (pieces) = $0.2 \times 1.960 \times 164 = 64.288$
- c. Standing area= area of waiting room (m^2) - area of seat model 1 (m^2) - area between seats (m^2)= $302.08 - 1.04 - 64.288 = 236.752$
- d. Standing capacity = standing area = $236,752 : 2 = 118,376$ standing dimensions

So it can be concluded that the capacity that can be served by the waiting room for gate 3 is = number of seats + standing capacity = $164 + 118 = 282$ passengers. So it can be seen that the gate-3 waiting room can serve 164 seated passengers and 118 standing passengers when there is an increase in the number of passengers during peak hours. Based on data on the number of passengers during peak hours, the currently available gate-3 waiting room is comfortable for passengers during peak hours.

3. Area of the Gate-4 Departure Waiting Room

- a. Seat area = number of seats (pieces) x seat dimensions of model 2 (m^2) = $164 \times 6.34 = 1.04$
- b. Area between seats = distance between seats x length of chair model 2 (m^2) x number of seats (pieces) = $0.2 \times 1.960 \times 164 = 64.288$
- c. Standing area= area of waiting room (m^2) - area of seat model 2 (m^2) - area between seats (m^2)= $289.24 - 1.04 - 64.288 = 223.912$
- d. Standing capacity = standing area = $223,912 : 2 = 111,956$ standing dimensions

So it can be concluded that the capacity served by the waiting room for gate-4 is = number of seats + standing capacity = $164 + 111 = 275$ passengers. So it can be seen that the Gat-4 waiting room can serve 164 seated passengers and 111 standing passengers when there is an increase in the number of passengers during peak hours. Based on data on the number of passengers during peak hours, the currently available gate-4 waiting room is comfortable for passengers if there is a busy peak hour.

4. Area of the Gate-5 Departure Waiting Room

- a. Seat area = number of seats (pieces) x seat dimensions of model 2 (m²) = 164 x 6.34 = 1.04
- b. Area between seats = distance between seats x length of chair model 2 (m²) x number of seats (pieces) = 0.2 x 1.964 x 164 = 64.288
- c. Standing area = waiting room area (m²) – model 2 seating area (m²) – area between seats (m²) = 249.17 – 1.04 – 64.288 = 183.842
- d. Standing capacity = standing area = 183,842: 2 = 91,921 standing dimensions

So it can be concluded that the capacity that can be served by the waiting room for gate 4 is = number of seats + standing capacity = 164 + 91 = 255 passengers. So it can be seen that the gate-5 waiting room can serve 164 seated passengers and 91 standing passengers when there is an increase in the number of passengers during peak hours. Based on data on the number of passengers during peak hours, the currently available gate-5 waiting room is comfortable for passengers during peak hours.

CONCLUSION

The results of the research conducted at Patimura Ambon International Airport, Maluku Province, were based on a calculation analysis using data on the number of passengers obtained from the apron movement control (AMC) unit office to calculate the area of the passenger departure waiting room with the formula contained in SKEP/347/XXI/99 which issued by the Director General of Civil Aviation. And the results of calculations with this formula get the result that the waiting room area needed in SKEP/77/VI/2005 is 220 m². Data obtained from the Task Executor Unit (UPT) Patimura Ambon International Airport, Maluku Province, it is known that the area of the waiting room for gate 1 and 2 passengers is 929.63, gate-3 is 30208, gate-4 is 289.24, and gate-5 is of 249.17. Whereas in the calculation of the area of the departure waiting room in SKEP/77/VI/2005 it is 220 m² with such an area of the departure waiting room at Patimura Ambon International Airport Maluku Province already balanced against standards based on SKEP/77/VI/2005 issued by the Director General of Transportation Air. Capacity served by departure lounges gate 1-5 at Patimura Ambon International Airport, Maluku Province. At gates 1 and 2 can serve 328 seated passengers and 378 standing passengers, gate-3 can serve 164 seated passengers and 118 standing passengers, gate-3 can serve 164 seated passengers and 109 standing passengers, gate-5 can serve 164 seated passengers and 83 passengers stood while for peak hour passengers there were 220 passengers. The need for seating facilities required by the Patimura Ambon international airport is currently in accordance with SKEP/77/VI/2005 issued by the Director General of Civil Aviation.

Suggestion: Patimura Ambon International Airport, Maluku Province, has provided very good transportation facilities. From the results of the researcher's analysis, Patimura Ambon International Airport, Maluku Province, should increase the expansion in a separate departure waiting room so that it can be adjusted because it really needs electric power in each waiting room in order to improve the quality of comfort and safety together between service users and functionaries for services. transportation that is effective, efficient and meets the standards in SKEP/77VI/2005 issued by the Directorate General of Civil Aviation.

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