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Thank you for participating,

Gregory Hamilton
President
Aviation Week Network

Acknowledged, agreed, and submitted by

_____   May 25th 2022
Nominee's Signature   Date

Nominee's Name (please print): Paulo Roberto Moritz Stolf
_____

Title (please print): Program Director
_____

Company (please print): Embraer SA

NOMINATION FORM

Name of Program: **One Embraer**
_____

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☐ Customer Approved

- o   Date:
  _____

- o   Customer Contact (name/title/organization/phone):
  _____

☐ Supplier Approved (if named in this nomination form)

- o   Date:
  _____

- o   Supplier Contact (name/title/organization/phone):
  _____

PLEASE REFER TO PROGRAM EXCELLENCE DIRECTIONS
AS YOU COMPLETE THIS FORM.

EXECUTIVE SUMMARY: Make the Case for Excellence *(Value: 10 pts)*
What is the vision for this program/project? What unique characteristics and properties qualify this program for consideration?
 (12 pt. Times New Roman) LIMIT YOUR NARRATIVE TO THIS PAGE.

Embraer has spun off its Commercial Aviation business as part of an announced agreement that was expected to become effective in 2020. However, following the separation of processes, people, systems and assets, this deal was cancelled. In a very daring decision given the complexity involved, Embraer decided to merge the spun-off part, aiming to recover operational and financial synergies, creating a program named One Embraer.

As the One Embraer Program was instated, all the elements to be merged were defined along with a strategy, governance, and management methods. Throughout the following 12 months, a portfolio of 54 different projects was executed to ensure that each functional area has performed everything needed to merge the companies. The last executed project was called "IT systems cutover", that loaded all merged data into several thousand different IT systems (including the ERP and its satellites).

Reintegrating was not a simple matter of bits and bytes, but of holding the company's culture together. Commercial Aviation personnel was not integrated to the main business. Communications between companies were hard, and the bureaucracy, along with the decision time, was increasing rapidly. But, the spirit of unity was always present, being part of Embraer's culture no matter which side someone belongs. All personnel involved in the Program became one team collaborating with the same vision. They were driven to achieve the goal of reintegrating the company, so Embraer could become One again.

To promote better alignment and manage expectations, the Program instated six principles. These were the guidelines that inspired and directed the Program actions. Thus, everybody linked their expectations to the Program's principles, giving them meaning and "momentum".

- Assure integration activities and focus on synergy - Initiatives and expectations must be related to the synergy recover, otherwise it was not part of the project scope.
- Keep it as simple and short as possible - Data, systems, and processes merge does not mean improvements or new IT application developments.
- Use minimum investment and ensure positive return - Although recover synergy is important, the actions needed to do so cannot cost more than the result obtained.
- With minimum business interruption - Business must be kept running, getting minimal interruptions.
- Use lean principles - Lean principles are in the core of what we are and must be reflected in the Program's execution, governance, and leadership.
- No major disruptions (minor noise) - Employees and the organization itself must not suffer unnecessary disruptions in their activities.

Excellence is built from learning and continuous improving, growing from the good foundation established by the best actions, decisions taken, and mistakes made. One Embraer Program learned from the E-Jets E2 program development by listing, analyzing, and adapting its program management and governance best practices. The result was a "state of the art" custom program management process.

One of Embraer's most notable events took place in January 2022, when the business was merged, and main processes and systems were unified with the participation of +2,300 employees that merged systems while keeping essential operations running. Everything was conducted to generate the least impact on business, operations, results, and customers, in a quick, simple way, with a predictive time management, which culminated within the expected deadline.

Do not exceed 10 pages in responding to the following four descriptions; allocate these 10 pages as you deem appropriate, but it is important that you respond to all four sections. DO NOT REMOVE THE GUIDANCE PROVIDED FOR EACH SECTION.

VALUE CREATION *(Value: 15 pts)*
Please respond to the following prompt:
➢ Clearly define the value of this program/project for the corporation
➢ Clearly define the value of this program/project to your customer
➢ Clearly define the value of this program/project to members of your team
➢ Clearly define the contribution of this program/project to the greater good (society, security, etc.)
(12 pt. Times Roman)

Value to Embraer:
The main result achieved by the Program was the tax and operational synergies recovery. Additionally, simplifying processes was essential, considering that Embraer strives to be a lean company and that "We strive for company excellence" is one of the Embraer cores values. Thus, during the Program, several processes were identified that could be improved and many other processes could be eliminated, since they were created just for the potential transaction that was not finished (the Spin-off).

Regarding tax synergy, the merge transaction eliminated extra taxes due to Taxable Events Intragroup (i.e.: transfer of material between different Legal Entities). After merge and the incorporation of the Commercial Aviation business unit into Embraer S.A., internal transactions under the same Legal Entities are no longer taxable events. Thus, Embraer do not need to make sales from one business unit to another and can also transfer material without paying extra taxes to the government. Apart from this elimination of taxable events, Embraer reduced the cost of tax compliance, audit fees, fewer invoices, and fewer taxable events to be calculated and reported. When talking about operational synergy, the main action taken was the elimination of duplicated processes, including the simplification of IT interfaces and additional steps built in software due to the Spin-off. As an example, as segregated companies, each one had its own methods and tools to manage a process. Embraer uses a document called "CD Note" for the quality nonconformity process. This document had to be duplicated, that is, whenever someone created a CD Note on the Commercial Business Unit side, the same CD Note had to be created on the Embraer side. Otherwise, none of the companies could proceed with the quality process. After the merge, the CD Note could be created just once, allowing an engineer to proceed with the quality process.

Value to Embraer customers: From the very beginning, when the business plan for the One Embraer Program was being created, it stated that it was mandatory to keep the business running, with minimal interruptions. The merge of data and IT systems required a cutover period of 25 days to avoid new data and data modifications. During this period, all company operations were paralyzed, except for those identified as critical to the customer.

Customers need continuous support and could not suffer because our lack of synergy. The planned activities were reorganized and managed to identify which could be performed out of the cutover period, in advance. This action, led and decided with participation of all key stakeholders, was essential to reduce the cutover from 25 to 21 days, ensuring minimum business interruption for data and systems merge. For Embraer customers, the greatest value of this Program was adequate service with available parts when and where needed. Since "We are Here to Serve Our Customers" is another Embraer core value, this was one of the biggest challenges of Services & Support during the Program. Thus, the Program decided for the creation of a parallel and temporary SAP instance, that we called SAP' (were the apostrophe sign meant parallel system) being able to process customer orders during the cutover phase with the aid of +500 employees. The result: no AOG (Aircraft on Ground event, meaning the customer couldn't fly) during the cutover phase were caused by cutover activities.

Value to Embraer team:
The companies split brought an uncomfortable situation for the employees. It was no longer possible to use the same systems for communication nor the same processes. Many of the processes needed to be duplicated to register the activities in the two companies, increasing the workload of the employees.

Additional processes and departments were created to support the supplier-customer relationship between the two companies, with all bureaucracy that it usually requires.

People's culture and morals were also severely affected. The facilities were differentiated and employees of one company needed prior authorization to physically access facilities of the other company. Companies' executives had to be switching systems to proceed with required approvals. More than simplifying processes, One Embraer Program allowed Embraer personnel to be under the same organizational chart again. Everyone now has the same e-mail address domain, the same chat system, they all can use office tools in a collaborative way. In a nutshell, the employees have a feeling of belonging, back to being one team, one Embraer, confirming another Embraer core value "Our People are What Make Us Fly".

Value to Greater good:

Embraer is a prominent company on the national scene, being a national pride and making a difference for the Brazilian trade balance. Aircraft exportation represents the twentieth product with the highest export value in Brazil, but the first when considering technological value, and the Commercial Aviation Business unit is responsible for half of this total. Beyond the Brazilian scenario, Embraer has a global presence, having facilities and offices in many countries. The United States play a key role in this process, supplying nearly 40% of the E-Jets E2 parts.

Embraer has an important role to play in the society where it acts, motivating communities to grow through its Embraer Institute. Embraer Institute sponsors and delivers social projects, including one of the best high schools in Brazil (Colégio Embraer). It gives poorer children a life-changing opportunity to learn and get to the best universities in Brazil and abroad. One Embraer Program enabled the company to bring back synergies, maintain lean operations, thus strengthening the path to support its strategic plan of recovery and growth. This allows Embraer to keep relevant role in the aviation industry around the world, creating thousands of direct and indirect jobs, technological knowledge, and thus keeping the economies running.

METRICS (Value: 15 pts)
Please respond to the following prompt:
➢ What are your predictive metrics?
➢ How did you perform against these metrics?
➢ How do your predictive metrics drive action toward program excellence? Please provide examples.
(12 pt. Times Roman)

Predictive metrics are part of the Embraer's culture, evolving from the successful launch of the E1 EMB-170 program back in 2002 and resulting on the record-breaking award-winning Embraer E-Jet E2 family, which was developed in just 58 months, from Program Launch (June 2013) to first revenue flight (April 2018). Embraer has developed a complete set of processes and tools to leverage behaviors that led to the Program goals outstanding achievements, which were internationally awarded, including a PMI Project of the Year Award, Aviation Week Grand Laureate Award and Aviation Week Program Excellence Finalist Award.

Therefore, predictive metrics are one of the key elements of the One Embraer Program success story, where several program and project management techniques were used and improved as mixed project arts. Theory of Constraints was applied, making effective use of the Critical Chain, creating and monitoring buffers to protect the schedule commitments. This management system created schedules that were managed preventively. Instead of only using a classic PDCA (plan, do, check, act), the schedule was monitored with buffer consumption (see picture 6). The buffer was a necessary schedule margin built at the end of the Master Program Plan (main schedule, which includes program phases and key milestones). This margin was used to accommodate issues that could not be anticipated. Solving issues that usually takes a lot of time and effort, so this preventive behavior using the buffer became key to successful time management.

The buffer consumption created a preventive PDCA, where management did not have to focus on making sure if the task was on time according to the plan for the day. Their focus was on taking decisions based on whether it would arrive on time, by looking ahead. This metric was effective on leveraging a behavior of what actions needed to be taken aiming to reduce buffer consumption. This behavior was reinforced by the leadership whose role was essential. All that the leaders did was to stablish a routine to ask why some of the projects and tasks had high buffer consumption and what could be done to reduce it (see the main buffer evolution in the picture attached). This shift helped to create schedule compressions and to prevent an overall program delay. Along with this preventive PDCA mindset, A3 methodologies were used to support the continuous improvement of processes and problem solving. Risk Issues and Opportunities were managed in an integrated way, thus generating unprecedented results.

A "War Room" was set with a video-wall (see picture 1) which made possible to monitor the near-real time progress of data loads among other important KPIs, generating a clear understanding of what was expected from everyone to achieve the Value Proposition goals. Frequent stand-up meetings (see picture 7) around the indicators' board showed the tasks priority, actions, and decisions to be taken, and what would come next. The teams also saw how the actions interacted and discussed on how some of them could be managed to be done in advance, reducing the cutover period. Then, tasks identified as part of the critical path got special attention, and the team built what we called "baton-pass rhythm", that is, the next actions could be predicted, and the following team assured that it was ready and waiting to start the following task of the critical path.

The War Room effectively showed the current activities and the next activities in the critical path, along with their interdependencies. When a baton-pass was needed, the teams from many parts of the Program worked together to align expectations, solve impediments, and coordinate the efforts being prepared for execution.

As an example, the Critical Path pointed out one task, belonging to one of the teams involved, scheduled to begin on the next package, that was essential to be performed on time. During the routine stand-up meetings, the leaders asked the team what the probability was to finish that task on time. The answer brought many concerns since the task would request more effort than estimated. The decision was to analyze the Critical Chain looking for all the precedent activities that could be done in advance. Other

decision was to ask for the team to extend the workhours, adding more skilled employees to ensure the execution to finish on time. The team had monitored closely the Critical Path, checking the tendency until this specific task had been declared done, on time, as predicted. As a result, the team was able to bring the Go-live date from January 25th to January 21st (see picture 2), reducing the cutover period for the customer, few days ahead of the promised date. Thus, Embraer confirmed its ability to deliver, keeping the customer trust.
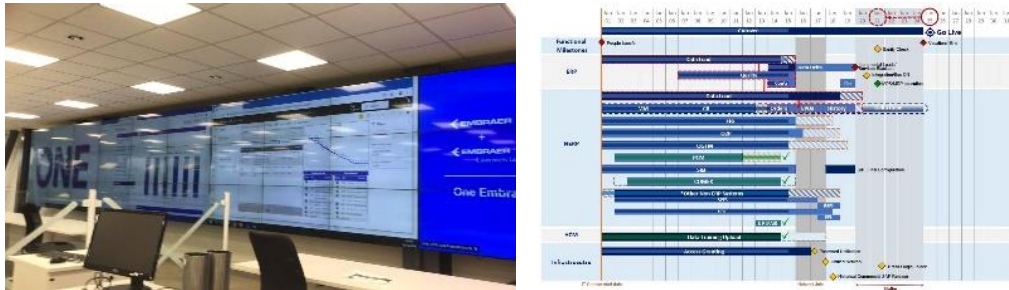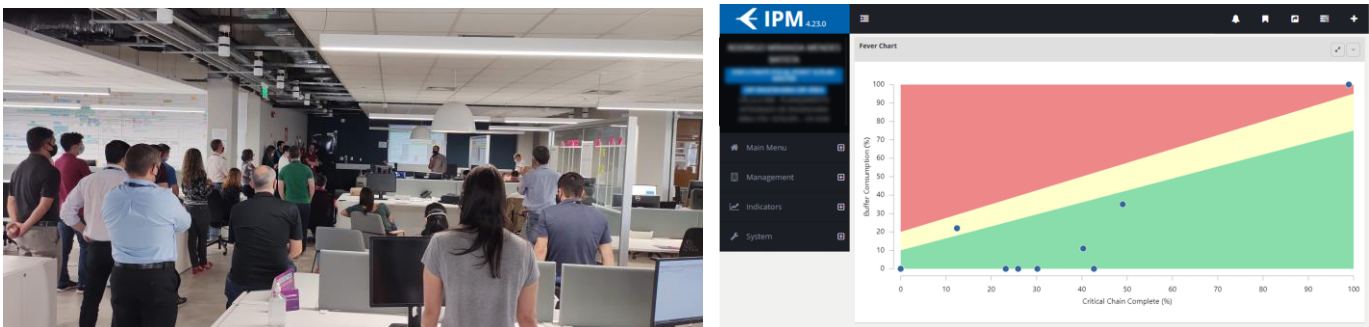

Picture 1 (right): War Room and Video-wall with KPIs
Picture 2 (left): Master Program Plan
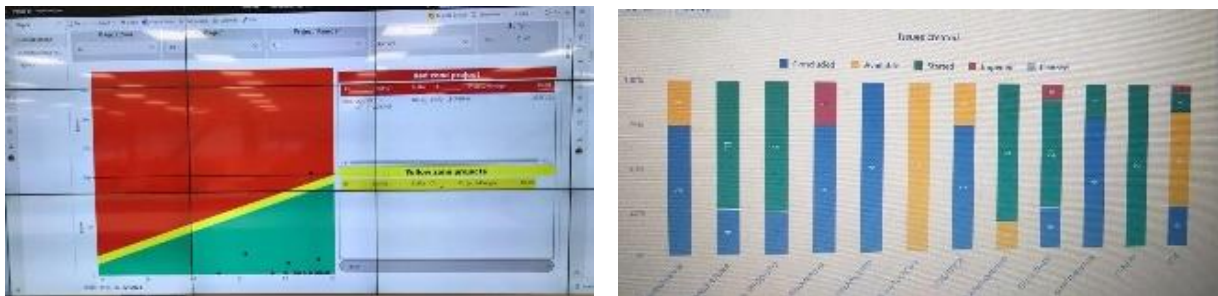
Picture 3 (right): Theory of Constraints Buffer KPI
Picture 4 (left): JIRA Data Load Status KPI

Picture 5 (right): The IMO (Integration Management Office) Team
Picture 6 (left): Buffer consumption history during the cutover period

Picture 7 (right): Daily stand-up meeting
Picture 8 (left): IPM tool

DEALING WITH PROGRAM COMPLEXITY (VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, OR VUCA)
*(*Value: 25 pts*)*
Please respond to the following prompts:
➢ *10 pts:* **Describe areas of VUCA faced by your program and why.**
➢ *15 pts:* **Explain how your team responded to these challenges.**
(12 pt. Times Roman)

In a Program of this magnitude, ambiguity was a continuous issue. Reintegrating a company is not an event seen every day. One Embraer Program team had to continuously rethink, combine, and create new processes, tools, and methods for the merge, dealing with unprecedented facts and contexts. Even big consulting firms could not assist us with complete methods to accomplish the merge, due to its peculiarity. To mitigate the uncertainties around the merge, two plans were created: the Business Continuity Plan and the Business Recovery Plan. The Business Continuity Plan was in place to ensure that Embraer continued to support customers and ran business in case of a major Program Go-Live delay. The main purpose was to support a delay of 15 days in the merge process. The other was a variation of a Disaster Recovery Plan, listing all actions needed to recover the company processes in case the merge did not work.

A company as Embraer represents the definition of a complex adaptive system. As soon as the companies were split, they started living their own lives: the processes evolved, inventories changed, parts and components were created or modified, employees hired and dismissed. In that context, the identification of the minimum set of initiatives that would potentially bring immediate value and synergy was highly challenging.

Using the Spin-off documentation, the team focused on the identification of duplicated processes, new processes specially created for the Spin-off, and resources newly acquired, such as software licenses, hardware, and IT infrastructure. Another huge task was to account for inventories on both companies including assets and parts. Despite the effort of collecting all this data, the business continued to evolve, causing data volatility. One could compare this effort with hitting a moving target. The team responded with unique and creative solutions, by creating a "frozen data set" and a set of incremental data, called "Delta data loads". The Delta data loads were composed by data created during the main data load. Thus, Information Technology applications were coded by the team aiming to differentiate the Delta from the data that was loaded previously and load the incremental data. Those incremental loads were scheduled to happen before, during and after the cutover phase, completing the whole set of new data created during the process. Along with the Delta data load solutions, many others were implemented, such as the IPM tool use (see Organizational best practices and team leadership section for details) and the use of a parallel SAP, called SAP' to continuously support our customers during cutover (as mentioned in the Value Creation section).

The COVID-19 pandemic scenario brought urgency in recovering synergy and rapidly executing the Program. Many of the suppliers' contracts newly revised or duplicated to cover for the Spin-off had to be listed and checked for synergies opportunities. But negotiations were tough due to the economic crisis in which the market dove in.

The modern models of work such as the remote work and hybrid work, where office employees could access systems remotely from home during some weekdays in such a massive scale was not part of daily Embraer operations and culture. Teams had to learn on how all could collaborate and accomplish tasks remotely and Embraer systems had to be adapted overnight to respond to the pandemic scenario adding uncertainty and complexity to the Program. The team had difficulties to communicate and collaborate since two different companies engaged in the process, and they were operating in different IT environments, which caused delays and frequent miscommunications.

Uncertainty that eventually could be faced by customers related to the Program implementation were rapidly addressed and minimized since day one. It started by a strong communication process, provisioning of parts and cutover preparation with a full year of anticipation. Results obtained show that customers trusted in Embraer's ability to deliver, along with our good services history. They understood the need for the merge and supported us in our efforts. As mentioned before, no AOG caused by the Program was registered. This represented a reward and recognition to the Program team by itself.

ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP *(Value: 35 pts)*
Please respond to the following prompts
➢ *15 pts:* Describe the innovative tools and systems used by your team
➢ *10 pts:* Define how you developed, led and managed people
➢ *10 pts:* How did you leverage skills and technologies of your suppliers?
(12 pt. Times Roman)

The company board, composed by the CEO and senior Vice-Presidents, appointed the CFO as the Program Sponsor. Then, the board designated a Program leader, answering to the CFO. As the Program started, it instated a Governance that describes the relationship between all leadership players, coordinated by the Program leader.

The Program leader structured a staff to support and coordinate the Program governance and the stakeholders involved. This staff was called IMO (Integration Management Office), a heterogeneous team composed by employees with different skills, knowledge, and experience, coming from the key areas of the company. As mentioned before, the Program's principles and Embraer core values guided and supported all Leadership and the IMO actions.

The complexity of the matters dealt during the execution of the Program and their interrelations across the company, required that the Program leader had sufficient knowledge of the company' processes, which is practically impossible. Thus, aside from the IMO, the Program leader assembled of a first-line team of senior employees whose knowledge and experience on many company processes and systems were the most effective way of determining how real an impact of decision could affect the Program or the company results. These workstream leaders were empowered by the Program leader within a trustful relationship, aiding with counseling, decisions and acting freely, under their knowledge, assuming risks and impacts. Therefore, trust was the word that defined the Leadership effectiveness.

The tool chosen by the Program governance was IPM (Integrated Project Management), a project management tool (see picture 8) that has brought versatility to the Program, allowing remote project management. IPM was developed internally at Embraer, its major requirement was to be a single-based tool, that is, the user should be able to manage projects both in an activity management level and a portfolio management level, allowing managers to make better decisions within the scope of a program. The project management knowledge areas, as listed in PMI PMBoK (scope, time, cost, risk, etc.) were divided into modules within the IPM. The most used module during One Embraer was the Project Time Management, in which the schedules were based on the Theory of Constraints concepts, taking advantage of CCPM – a tool also developed at Embraer to manage projects based on Critical Chain method, using time buffers and Fever Chart. The CCPM tool represents an evolutionary and maturement of the Critical Chain method application, recognized by the TOCICO POOGI award to E-Jets E2 development.

Since many different IT tools were used during the process, the teams orchestrated and integrated them by having several Microsoft Project schedules aligned and linked together composing the Master Program Plan. As soon as the schedules were integrated, a ProChain software was applied to calculate the schedules' buffers allowing them to be uploaded into IPM. The team chose to use JIRA software for activity management process using the Lean Management Kanban method, so tasks could have its progress informed. An integration was made between IPM and JIRA, where the information stored in the IPM database was sent to JIRA, creating cards so the team could update the tasks' information. Once this information returned to the IPM database, it could calculate the project position on the Fever Chart, automatically providing predictive metrics (see pictures 2, 3, 6 and 8).

The Program' KPIs were generated using a Microsoft Power BI chart and plotted in the video-wall at the War Room. Once Deming said, "you can't manage what you can't measure". As important as creating a management routine, the leadership needed to ensure that it would be followed, generating results.

People leadership at Embraer strongly follows Lean management principles, being part of Embraer's culture. During this Program, the leadership applied Fujio Cho principles: Go see, ask why, show respect. All the Program team members were encouraged to bring forward the issues that could prevent the Program progress and goals to be achieved. The Program' leadership were always present, near to

the teams and the activities they were doing. They built communication channels and established commitments at all levels of leadership, reinforcing the importance of the Program. There was no doubt for the entire organization how important it was eliminating the inefficiencies that were created after the split. The staff involved in the Program were determined to make it work, creating an atmosphere, a desire, positively contaminating the environment of the Program. One Embraer team delivered something above what was expected, confirming Embraer's moto: Challenge, Create, Outperform.

Talents were naturally appearing in this process, some knowledgeable people taking part in the Program began to emerge as leaders, making up a "transition" from advanced users to key users, leading and participating on important definitions, gaining exposition to the organization leadership. That way, the Program leaders encouraged the development of new qualified professionals and new leaders.

To coordinate the necessary decisions to accomplish the Program goals, decision forums were established. A Board of Directors Forum – Monthly reports from the Program leader about the Program status and high-level decisions with CEO, senior Vice-Presidents, and the Program Sponsor. A Core Team Forum – once a week alignment of Program status and first level of decision making with the many Directors involved in the Program, some of the key users, and IMO. Program alignment meetings – twice a week follow-up on the many projects and work fronts identifying issues and decisions to be solved or escalated to other leadership forums with senior Employees, Managers and Program Managers leading the initiatives.

When the management ritual was defined, it was also defined how it would work at each level of the organization. A typical relationship among all players can be illustrated by an example. Let us suppose that, during the execution of a Project task, the project team has identified an obstacle, someone raised a question or verified that the data to be merged is not consistent. The project leader would immediately point to the IMO as a "red flag", something that prevents the project from progressing as planned. In Lean organizations, this event is also known as an Andon red flag. The IMO should then collect all the reported issues and organize meetings with the senior employees trying to reach workable solutions. In a worst-case scenario, the decision about what solution should be taken was escalated to the Core Team Forum, where the project leader supported by the IMO would present the problem found and the viable solutions, with pros and cons. The Core Team led by the Program leader would then analyze the issue considering the interrelations and the impacts across the company, deciding for one of the solutions or requesting more details considering lack of information or need for data. Supposing the problem that surfaced was impacting the company's results or the Program higher goals, the decision would then be escalated to the RD (Board of Directors Forum) where would be presented along with the possible detailed solutions and a decision would be made, considering impacts and risks to the Program and the company.

Considering company operation's context, aiming to plan for the cutover period that caused production downtime, the suppliers were contacted and prepared months before the production interruption. Then, the supply chain was promptly planned to provide parts for advanced production and delivery of all aircrafts by the end of the year. Since December is known as a volatile month when related to aircraft production delivery, and additionally, the systems could present instabilities due to the data load merge, actions were taken to avoid these potential problems. Thus, the manufacturing was planned to do a safety inventory, a buffer. As soon as the production downtime was defined for January, manufacturing activities were hastened so it could stay 21 days without production, shipping it in advance.

Regarding One Embraer Program suppliers and consulting firms, they were constantly challenged in terms of predictive management and changing their mindset to keep cutover buffer preserved before it starts and find feasible solutions to deal with ingrained constraints. They were also requested to prepare a 24x7 routine to support any issue that could happen during the cutover period.

The One Embraer Program spirit, leadership and discipline could be summarized quoting Taiichi Ohno: "Forget about what you accomplished yesterday. Do not think about tomorrow either. Something is wrong and wasteful with what you are doing now and today. There is still room for continuous improvement as we speak". Embraer has still a long way ahead in its journey of excellence.