



**Technical Assignment of Škoda Auto a.s.
Part I – 10 Production System of Škoda Auto a.s.**

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Abbreviations:

ITS Internal Technical Standard
 SOP Start of the production
 TPM Total productive maintenance

Change History

Status	Date	Description
1.0	1 Oct 2016	New wording



1. Production Concept

The priority for equipment planning is its effective usage and contributions/benefits. Within the production system of ŠKODA AUTO, the goal is basically to prevent or minimise waste (work operations, activities, procedures etc. that do not bring any contribution or create any values). The priorities are to be put on operators of devices that create values. In relation to this, all internal (especially ITS, technical assignment part I-08 Ergonomics) and legal ergonomic requirements have to be adhered to.

1.1. Material Systems, Parts Preparation

The following points must be approved with the ordering party:

- Parts preparation is implemented on the basis of logistic concept (potential background documentation for its processing is available to the supplier in the part II and III of the technical specification for the production area or for the project). The parts must be easy to withdraw and positioned as close to the point of usage as possible.
- Material at the installation site must have assigned areas planned and marked for it.
- The work area must have assigned areas planned and marked for empty containers.
- The line area must have assigned areas planned and marked for parts marked as defective.
- Container drawing must be planned so that they are easy to change. Empty container handling has to be conceived in relation to that.

2. Teamwork

2.1. Work Organisation

In order to implement the work organisation, the supplier is obliged to request the required information in order to secure the following points:

- Employees in the production areas of the VW group are organised into production teams. One production team includes approximately 10 job positions.
- Each team must be assigned a team area according to the group standards, which are used for team communications and breaks. The area marked in the team activity area must be marked in the layout.
- Team concept must be visualised in the workplace plan.
- There must be plans for containers with: simple manipulation, fixation, free access, ease of exchange with no obstructions etc.

2.2. Qualification

For the purpose of worker qualification, the ordering party must be informed on required expert knowledge in timely manner (for SOP, a qualified worker must be present at each workplace). Personnel qualification training concept (training/briefing) must be agreed on with the ordering party in a timely manner.

3. Marking and Labels

- Equipment and machines must be made in colour according to the colour standards of the ordering party.
- Visualisation elements have to be installed for processes marked as “OK”, as well deviance indicators, see part III project-specific or related ordering party background documentation (part IV).



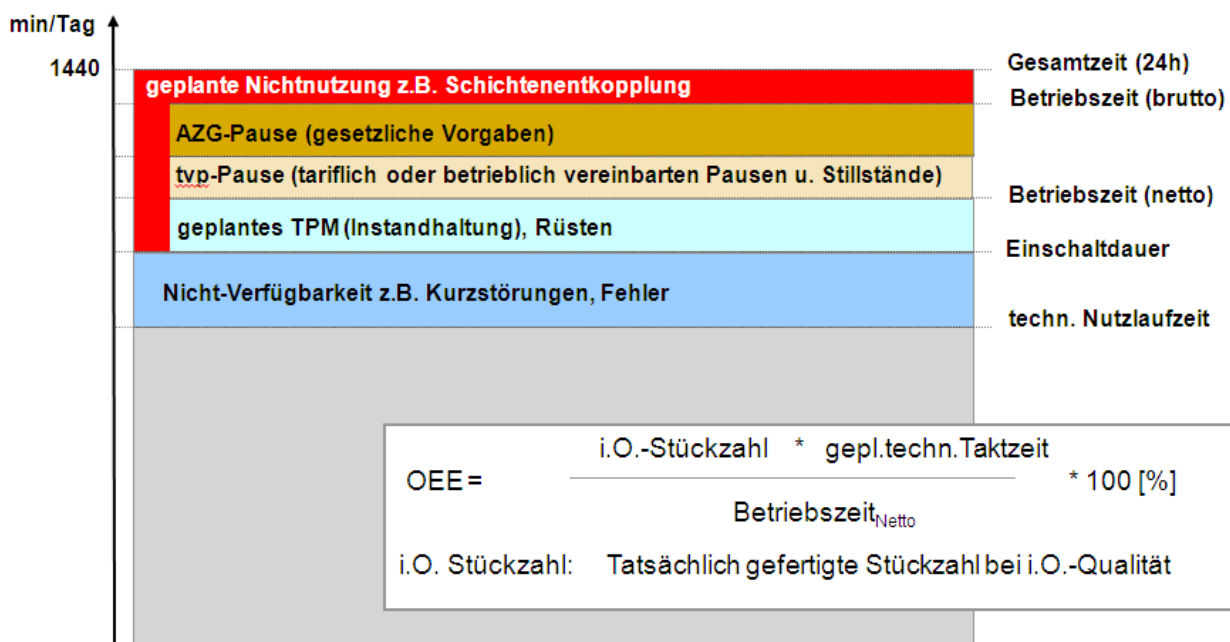
4. Total Productive Maintenance, TPM

TPM is a system of continuous improvement to which all employees contribute and which results to optimal machine availability thanks to productive maintenance (cleaning, servicing, inspections). Organisation within business: TPM time windows, technical outages, equipment effectiveness, technical time of cycle, quantity or capacity, see technical assignment II and III.

- TPM systematic aspects are integrated into work procedures via teamwork. Integration measures must be presented to the ordering party and approved by them.
- Equipment lifecycle costs must be quantified by the supplier. Specific values required for the calculation must be requested by the supplier.
- Maintenance, inspection and cleaning are performed by the operators themselves, depending on their capabilities. This must be taken into account when designing the equipment and enabled via suitable training.
- Existing change logs, maintenance/inspection/cleaning plans for similar devices must be used for the purpose of the device optimisation.
- Design meetings must be organised between the planner, equipment designer, operator and maintenance worker.

5. Definitions and Formulas Related to Equipment Effectiveness

The equipment effectiveness is a proof of manufacturing flawless piece quantities and availability.





Min/Tag	Min./day
Geplante Nichtnutzung z.B. Schitenentkopplung	Purposely unused equipment, e.g. to subdivide individual shifts
Typ-Pause (tariflich oder betrieblich vereinbarten Pausen u. Stillstände)	Breaks (breaks and delays arranged within the framework of a collective contract or operation)
Geplantes TPM (Instandhaltung), Rüsten	Planned TPM (maintenance), settings
Nicht-Verfügbarkeit z.B. Kurzstörungen, Fehler	Unavailability, e.g. short malfunctions, errors
Gesamtzeit (24h)	Total time (24h)
Betriebszeit (brutto)	Operation time (gross)
Betriebszeit (netto)	Operation time (net)
Einschaltdauer	Activation time
Technician Nutzlaufzeit	Technical operation time
i.O.-Stückzahl	Number of "OK" parts
Gepl. techn. Taktzeit	Planned technical time of cycle
Tatsächlich gefertigte Stückzahl bei i.O.-Qualität	Actually manufactured quantity of "OK" pieces

Eligibility of defined quality marks must be proven.

When determining or calculating the equipment effectiveness, potential technology-specific specifications (formulas) listed in part II must be taken into account.

It must be taken into account that parts positioning manual activities cannot be defining for the cycle time (the positioning time is the same or shorter than the planned cycle time).

5.1. Minimum Equipment Effectiveness Values

- Required minimum equipment effectiveness, as well as all other framework conditions, is described in the technological part II or project part III.
- All TPM activities specified by the supplier and approved by the ordering party that are to be carried out by the equipment operator have to be doable within the specified TPM time (e.g. 30 min/shift – TPM time window).
- For production devices that have to be rebuilt, at least the existing equipment effectiveness value must be achieved; the supplier is potentially obliged to demonstrate the efficiency free of charge via repeated simulation. When the specified equipment effectiveness values have been achieved, interruption of functional bonds between and in individual production devices must be taken into account.

5.2. Approval

Plans and background documentation created for the production equipment must be approved according to individual plan steps between the supplier and the ordering party's contact persons (e.g. production planner, operator, industry engineers); the supplier is obliged to make alterations and log records if needed.

The supplier is obliged to provide information on the current project status during regular project negotiations.



5.3. Changes

The requirements on the production systems mentioned above must be ensured even in case of changes. For example, changes may incur from the following elements:

- product,
- operational assets,
- production processes,
- spatial ratios,
- existing local limitations within the hall,
- work progression,
- ergonomic concept of workplace,
- workplace number reduction,
- investments,
- logistic processes,
- quantities,
- operation organization
- and so on.

6. Q – Andon (Quantitative Andon)

Each piece of equipment must include deviance reporting system and an option to report problems including the visualization of this message, visible for all employees.