

# CREW EVALUATION<sup>1</sup>

by Robert A. Nosse

Crew Evaluation, what is it? According to Webster, "crew" means a group of people working together, and "evaluation" means to find the value or amount of. By putting the two together, it now becomes, the value of a group of working people. In the line clearing industry, this is commonly achieved by taking the time spent trimming trees and dividing it by the number of trees trimmed, which gives us man-hours per tree trimmed. It is this figure and term that are commonly used to express the value of the crew.

But is this crew evaluation? Yes, if the contributions of management and supervision were factored out in figuring the value of the crew's contribution to the end product of trees trimmed.

To find crew evaluation, the system used should measure factors governed by the crew in determining their value toward the product, while excluding factors contributed to the product by other parts of the organization. If this is not accomplished by some means, the value expressed for the crew is some type of organizational evaluation expressed as the value obtained from one of the organizational components.

It was for this reason a system called CPPE was created to evaluate crews. It stands for Crew Performance Productivity and Effectiveness. In creating the system, it was necessary to identify the crew's work activities and code them for easy recording, and establish some standard time periods to complete certain types of work.

Some of the work activities and standard time periods used in the system are as follows:

## Line Identification

Code	Distribution Lines
1	Use when working for or on primary or secondary service drops or street lights.
	Transmission Lines
	Use the following codes when working for or on:
2	23 kV Transmission Lines
3	34.5 kV
4	69 kV
5	138 kV
6	345 kV

## Trimming Activity Codes

Code	Use Codes
10	Trimming trees for or on secondary service drops or street light conductors
11	Topping or rounding over a tree
12	Side or through trimming
13	Trimming a tree that is overhanging the conductor

## Tree Removal Codes

Use the following codes when:	
14	The tree is under the conductor
15	The tree is beside the conductor
16	The tree is overhanging the conductor
17	The tree is removed and no conductor is involved

## Work Related Activity Codes

Code	
71	Line shop or reporting location time
72	Travel time
73	Chip, wood disposal
74	Called away from scheduled work area
76	Working on tools
77	Time lost due to finding a job unworkable

## Crew Codes

100	Bucket truck
200	Rope truck
300	Spray truck

## Employee Class Codes

32	Tree trimming working foreman
36	Trimmer A
37	Trimmer B
38	Trimmer C
39	Trimmer D

## Standard Times to Complete Units

### Tree Trimming

Units	Code	Hours	Hours
		100 Crew	200 Crew
	110	.50	.80
	111	1.60	2.00
	112	1.00	1.30
	113	1.30	1.20
<i>Tree Removal</i>			
	114	1.50	2.10
	115	1.70	2.00
	116	4.00	5.40
	117	.60	.90

With these codes, the crew is then instructed to report on a job ticket the work activities they engaged in and the time they spent doing them.

This would show up on job tickets as illustrated in Fig. 1 and Fig. 2. From these job tickets it is now possible to compute the value of a crew and

<sup>1</sup>Presented at the annual conference of the International Society of Arboriculture in Louisville, Kentucky in August 1982.

compare their value to other crews and gain some insight on how other parts of the organization may be helping or hindering the crew.

Before we do this, let's first compute their value under the man-hour per tree trimmed method.

**Crew comparison based on man-hour per tree trimmed**

	Crew I	Crew II
Men in crew	2.0	2.0
Trees trimmed	10.0	16.0
Man-hours in crew	16.0	16.0
Man-hour/tree trimmed	1.6	1.0

Without standard times, the only thing possible is to compare one crew against the other, and what are you comparing? What do you do if you have only one crew? In addition, this situation leaves us explaining the difference by reason that one crew's trees may be larger, travel time greater, or maybe it had something to do with secondary or primary lines. All or one of the reasons may be true but should not be relied upon unless then can be verified by some means.

By using the CPPE system these reasons are verified by breaking down the time spent on the various work activities in three areas — work-related time, line activity hours, and standard times for units. Let's look at this more closely.

**Work-related hours**

	Crew I	Crew II
Shop time hours	.50	2.50
Travel time hours	3.00	2.50
Chip disposal hours	1.00	—0—
	4.50	5.00

**Line activity hours**

Units of work	Units of work completed	
	Crew I	Crew II
110	3	12
111	5	—0—
112	1	4
113	1	—0—
	10	16
	Crew I	Crew II
	(hours)	(hours)
Standard time for units	11.8	10.0
Actual time for units	11.5	11.0

These figures are then used to find:

**1. Crew performance**

Performance = a measure of the amount of work produced while on the job.

$$\text{Performance rate} = \frac{\text{Standard time for units}}{\text{Actual time spent on units}}$$

CREW PERFORMANCE RATE  
Average is 100-125%

Crew I	Crew II
$\frac{ST\ 11.8}{AT\ 11.5} = 102\%$	$\frac{ST\ 10.0}{AT\ 11.0} = 91\%$

**2. Crew productivity**

Performance = a measure of the amount of work produced while on the job.

$$\text{Productivity rate} = \frac{\text{Time Spent on Producing Products}}{\text{Time Available for Producing Products}}$$

CREW PRODUCTIVE RATE  
Average is 80-90%

Crew I	Crew II
10 Units	16 Units
$\frac{TSP\ 11.5}{TAP\ 16.0} = 73\%$	$\frac{TSP\ 11.0}{TAP\ 16.0} = 69\%$

**3. Crew effectiveness**

Effectiveness = a measure of work produced as related to the time available for working.

$$\text{Effectiveness} = \text{Performance Rate} \times \text{Productive Rate}$$

CREW EFFECTIVENESS RATE  
Average is 80-85%

Crew I	Crew II
Performance 102%	Performance 91%
Productive $\times 73$	Productive $\times 69$
74%	63%

Let's look at the two methods together:

**CREW COMPARISON USING THE TWO SYSTEMS**

**MAN-HOUR/TREE TRIMMED**

	Crew I	Crew II
Man-hour/tree trimmed	1.60	1.00
CPPE		
Performance rate	102%	91%
Productive rate	73%	69%
Effectiveness rate	74%	63%

What are the advantages of the CPPE System?

- 1) The crew is valued on its merits.
- 2) It verifies how the time was spent.
- 3) It explains some of the difference between crews and points out what areas may need improvement.

FORM 400.1  
I.D. NO. 860-847-2

OHIO EDISON COMPANY  
**FORESTRY JOB TICKET**

S **(M)** T W T F S H

WORK PERFORMED BY XYZ (CONTRACTOR)  O.E. CO. CREW NO. I DATE 12-22-75  
 DIVISION \_\_\_\_\_ DISTRICT \_\_\_\_\_ CREW CODE 100 FOREMAN Dick J. (SIGNATURE)

NAME	CLASS CODE	RATE			CLEARING		TOTAL HOURS	EQUIPMENT			REMARKS
		1.0	1.5	2.0	CODE	HOURS		CODE	NO.	HOURS	
DICK J	32	8						Buck	8		
SUE K.	36	8						CHIP	8		

STREET NAME	GRID OR PLATE MAP	POLE NO. ST. NO.	WORK ORDER	ACTIVITY CODE	UNITS	TIME *			SPEEDOMETER		
						START	STOP	MAN HR'S.	OUT	IN	MILEAGE
SHOP				71		8.00	8.25	.50			
				72		8.25	9.25	2.00	200		
BAY ST	10	6		110	3	9.25					
				112	1						
				113	1	12.0		5.50			
				LUNCH		12.0	12.5				
		12		111	5	12.5	3.5	6.00			
				73		3.5	4.0	1.00			
				72		4.0	4.5	1.00		290	90
						<u>10</u>		<u>16.00</u>			

\*CREW TIME TO BE REPORTED IN MULTIPLES OF 15 MINUTES

REMARKS:

CHECKED BY \_\_\_\_\_

APPROVED BY \_\_\_\_\_

Figure 1. Crew No. 1. job ticket

FORM 400.1  
E.C. NO. 360-847-3

OHIO EDISON COMPANY  
FORESTRY JOB TICKET

S (M) T W T F S H

WORK PERFORMED BY XYZ (CONTRACTOR)  O.E. CO. CREW NO. II DATE 12-22-76  
 DIVISION \_\_\_\_\_ DISTRICT \_\_\_\_\_ CREW CODE 100 FOREMAN Joe M. (SIGNATURE)

NAME	CLASS CODE	RATE			CLEARING		TOTAL HOURS	EQUIPMENT			REMARKS
		1.0	1.5	2.0	CODE	HOURS		CODE	NO.	HOURS	
JOE D	32	8						Buck	8		
DICK B	36	8						CHIP	8		

STREET NAME	GRID OR PLATE MAP	POLE NO. ST. NO.	WORK ORDER	ACTIVITY CODE	UNITS	TIME*			SPEEDOMETER		
						START	STOP	MAN HR'S.	OUT	IN	MILEAGE
SHOP				71		8:00	9:00	2:00			
				72		9:00	10:00	2:00	100		
LAKE ST	28	2		110	12	10:00	12:00	4:00			
				LUNCH		12:00	12:50				
		15		112	4	12:50	4:00	7:00			
				72		4:00	4:25	50	160		
SHOP				71		4:25	4:50	50			60
					16			16:00			

\*CREW TIME TO BE REPORTED IN MULTIPLES OF 15 MINUTES  
REMARKS:

CHECKED BY \_\_\_\_\_  
APPROVED BY \_\_\_\_\_

Figure 2. Crew No. 2. job ticket

4) It can show areas where other parts of the organization may be contributing to the crew's effectiveness or lack of it.  
In closing, I shall leave you with one question — can you verify which of your crews is returning to

you the value you expected from them?

Ohio Edison Company  
76 South Main Street  
Akron, Ohio 44308